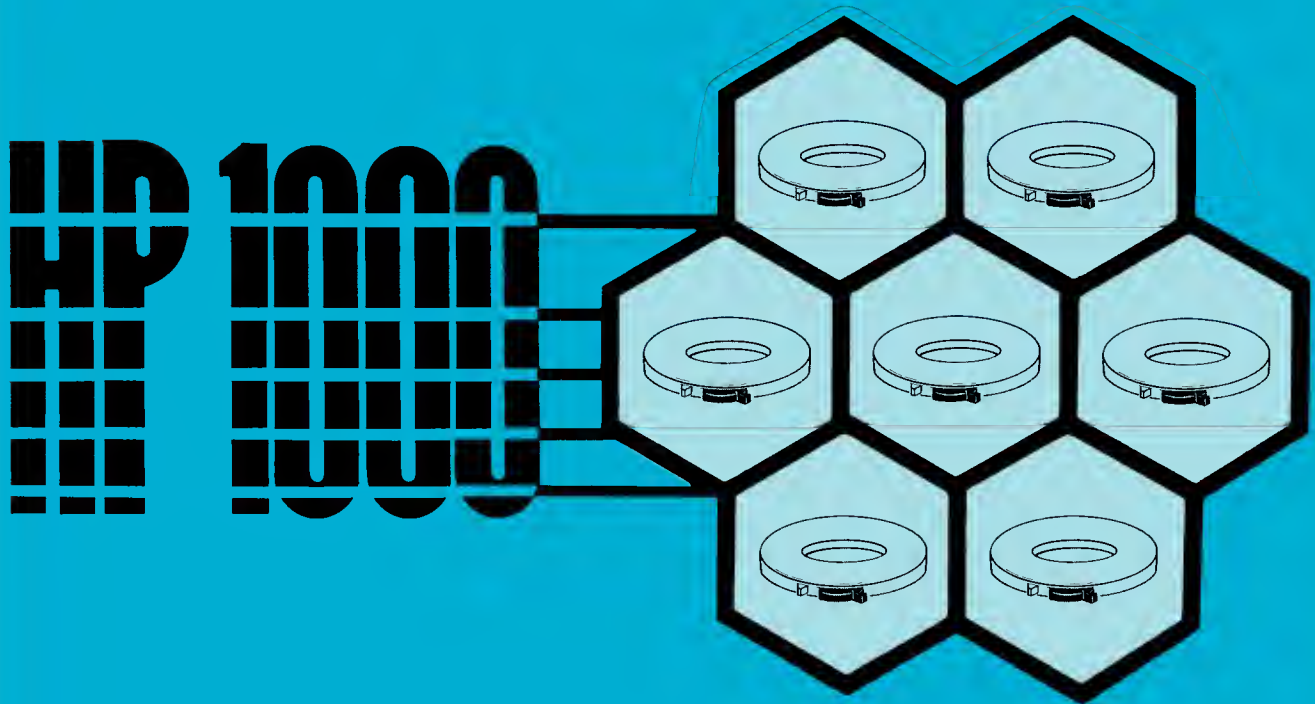


GETTING STARTED WITH YOUR PRIMARY SYSTEM

HP 1000 RTE-IVB Operating System



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PRINTING HISTORY

The Printing History below identifies the Edition of this Manual and any Updates that are included. Periodically, Update packages are distributed which contain replacement pages to be merged into the manual, including an updated copy of this Printing History page. Also, the update may contain write-in instructions.

Each reprinting of this manual will incorporate all past Updates, however, no new information will be added. Thus, the reprinted copy will be identical in content to prior printings of the same edition with its user-inserted update information. New editions of this manual will contain new information, as well as all Updates.

To determine what software manual edition and update is compatible with your current software revision code, refer to the appropriate Software Numbering Catalog, Software Product Catalog, or Diagnostic Configurator Manual.

First Edition	Jan 1983	Introduction of Primary System disc
Update 1	Oct 1983	2176E and 2177F

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PREFACE

This manual is intended to familiarize you with the RTE-IVB Primary System as quickly as possible. After you have gone through this manual, you can go to other manuals for more detailed information. A list of manuals is provided in the RTE-IVB Software Numbering Catalog (92068-90011).

Chapter 1 introduces the Primary System and the Primary System disc.

Chapter 2 leads you through the system start-up and shut-down procedures.

Chapter 3 guides you through certain system housekeeping operations to familiarize you with system management.

Chapter 4 describes more system maintenance procedures. These are steps to allow additional concurrent program execution, to change your system configuration, and to generate your own system.

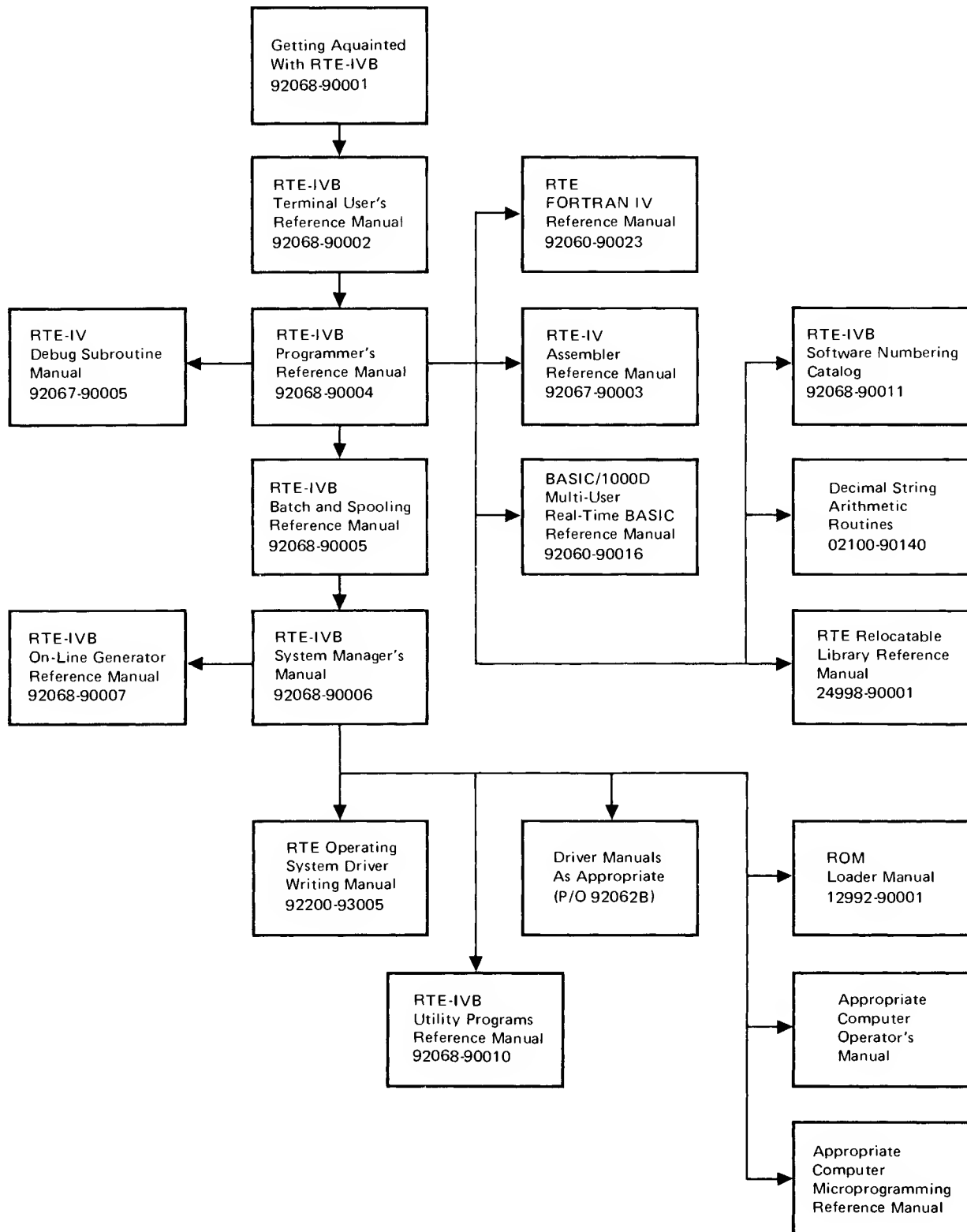
Appendix A describes boot-up troubleshooting.

Appendix B describes the manual system start-up procedure.

Appendix C describes restoring your software onto disc.

Other sources of information for the system manager are found in the RTE-IVB System Manager's Reference Manual.

RTE-IVB DOCUMENTATION MAP



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Chapter 1

INTRODUCTION

PRIMARY SYSTEM

The Primary System is a preconfigured system designed to facilitate software installation of the HP 1000 Computer System with RTE-IVB. The Primary System is supplied on a Primary System disc that can be booted up by the HP Customer Engineer installing the system. A tested, working operating system is available to test the functionality of the install hardware and to demonstrate the operations without performing a system generation. The Primary System is a starter system with sufficient capabilities that can be used by system users until a customized system is generated by the System Manager.

The Primary System software consists of the factory generated operating system and the RTE-IVB relocatable modules. It is delivered on a medium appropriate to your system. There are four Primary Systems (400 through 403) to support the HP 1000 Computer System with the E- or F-Series processor. The medium on which the Primary System is supplied is determined by your disc model.

PRIMARY SYSTEM DISC

The Primary System disc number is found on the front of the disc or the top of the disc pack. Compare this number with the list of numbers given below to verify that the correct Primary System medium has been supplied for your system.

Logical Primary System Number	Part Number	Medium
400	92068-13002	7905M/7906M disc
	92068-13006	7920M disc
401	92068-13003	7925M disc
402	92068-13004	7906H disc
	92068-13007	7920H disc
403	92068-13005	7925H disc

The Primary System provides a configured operating system that is not processor dependent. However, an option is provided to allow reconfiguration of the processor if needed. Each disc also contains all the HP 92068A RTE-IVB operating system components. These are the relocatable modules located on LU 10 of the Primary System disc. The configuration of the Primary System is described in Appendix A of the RTE-IVB System Manager's Reference Manual (92068-90006).

Introduction

The configuration of the Primary System is shown in the system answer file and list file that are included in the Primary System. Identification of the system answer file and list file is shown below.

System Number	Disc Type	Answer File Name	List File Name
400	7905M, 7906M, 7920M	#AN400	<input checked="" type="checkbox"/> LF400
401	7925M	#AN401	<input checked="" type="checkbox"/> LF401
402	7906H, 7920H	#AN402	<input checked="" type="checkbox"/> LF402
403	7925H	#AN403	<input checked="" type="checkbox"/> LF403

SYSTEM BACKUP

The Primary System disc should be backed up immediately after system installation. This will ensure that a working system is always available for troubleshooting in case of any catastrophic system problems. The off-line backup procedure is given in the RTE-IVB Utility Programs Reference Manual (92068-90010).

Chapter 2

SYSTEM START-UP AND SHUT-DOWN

STARTING UP YOUR SYSTEM

When your disc-based HP1000 system is installed, the RTE-IVB Primary System resides on the Primary System disc cartridge. The only procedure necessary to load the Primary System into memory and make your system operational is to turn on the components and insert the Primary System disc cartridge into the disc drive. The Primary System loading and start-up are entirely automatic. To start-up your system it is assumed that your system has been shut down following the SYSTEM SHUT-DOWN procedure given later in this chapter.

If you want to reconfigure your system for any reason, perform steps 1 through 4 given below and then perform the manual boot-up procedure as described in Appendix B of this manual.

AUTO BOOT-UP

Given below is the simple procedure to be followed in starting up your system. If you have previously been through these steps and have followed the SYSTEM SHUT-DOWN procedure, you may wish to skip ahead to the SYSTEM START-UP SUMMARY at the end of this section, otherwise proceed to the procedure given below.

STEP 1. TURN ON DISC DRIVE POWER

Ensure that the Battery Switch is set to "OFF".

If your system is the 2176C or 2177C (vertically racked model), go to the front of the cabinet and locate the system ON/OFF power switch in the upper right corner of the rack, as shown in Figure 2-1. Press this switch, which should light up.

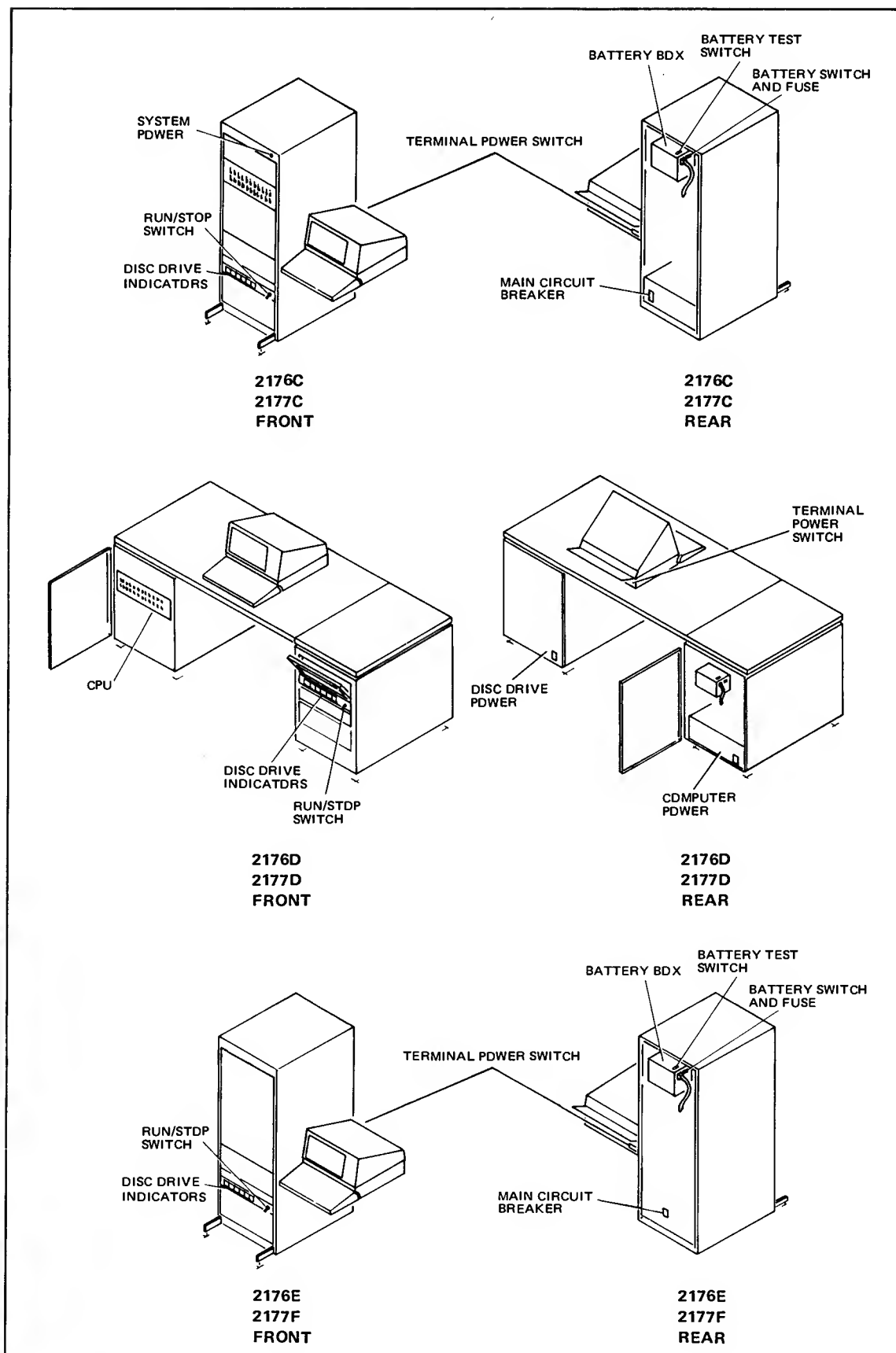
If your system is the 2176D or 2177D (desk model), go to the rear of the disc drive unit. Locate the power switch in the lower left corner as shown in Figure 2-1 and set it to ON.

STEP 2. TURN ON MAIN POWER TO COMPUTER

If you have a 2176C or 2177C (vertically racked model), you turned on the main power to the computer when you set the system ON/OFF switch to ON. Proceed to Step 3.

If you have a 2176D or 2177D (desk model), set the Battery Switch to "OFF" and locate the POWER switch at the rear of the computer mini-rack in the bottom left corner, shown in Figure 2-1. Set the POWER switch to ON.

System Start-Up And Shut-Down



7700-454A

Figure 2-1. System Switches

STEP 3. INSERT DISC CARTRIDGE/PACK

If you want to change or insert a disc cartridge, first set the RUN/STOP switch on the front of the disc drive (see Figure 2-1) to STOP. When the DOOR UNLOCKED light comes on, open the door of the drive, pulling the top of the door firmly out towards you, and pull out the cartridge. Insert a new cartridge by grasping the handle of the cartridge, and with the labeled surface up, slide the disc in and close the door.

STEP 4. SET RUN/STOP SWITCH

On the front of the disc drive cabinet, locate the RUN/STOP switch. Set it to RUN and observe that the door unlocked light goes out.

If manual boot-up is to be performed, proceed to Appendix B.

STEP 5. VERIFY CORRECT SYSTEM START-UP

Turn the power switch at the rear of the terminal to ON. If power is already on, press the RESET button twice in rapid succession.

"TERMINAL READY" should be displayed at the top of the screen of the system console. Look at the DISC READY indicator on the front of the disc drive unit. It will take about 30 seconds for the disc to come up to speed, and the DRIVE READY indicator will light. Now look at the system console. A message will be displayed indicating that the various subsystems in your Primary System are being initialized. Then you will see the message:

```

* *****
*
*           HP 1000 SYSTEM
*
*   System Start Up Completed
*
*   System Date Code: XXXX
*
* *****

```

Your Primary System is running and ready for use.

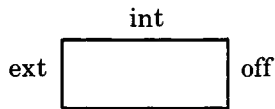
If you have no display on the system console:

- Check to make sure the terminal is plugged in and that the power switch under the rear door of the terminal is set to ON.
- Perform the SHUT-DOWN procedure and then wait 5-10 seconds.
- Perform the START-UP procedure again.

If you still have no display, see "Boot-up Trouble-Shooting" in Appendix A.

STEP 6. TURN ON POWER FAIL BATTERY

Now that the system is running, locate the battery box inside the rear of the computer cabinet. Find the battery switch marked:



behind the battery cable as shown at the top of Figure 2-1. Set this switch to int. This turns the power-fail battery ON, which protects the main memory of the computer for up to two hours if the power should fail. When power returns, the computer will then be able to resume operation with no loss of memory.

If the real time clock is to be kept by your system, enter the time using the TM command. See the RTE-IVB Terminal User's Reference Manual for details of this command.

Now proceed to Chapter 3, "Getting Acquainted with Your System", for your first steps in system operation.

SYSTEM START-UP SUMMARY

1. Set Battery Switch to "OFF".
2. Turn on MAIN POWER for disc drive and computer.
3. Insert your System disc cartridge/pack into the disc drive.
4. Set RUN/STOP switch to RUN.
5. Verify correct system start-up.
6. Set Power Fail Battery switch to "INT".

SYSTEM SHUT-DOWN

CAUTION

Always set the Disc Drive RUN/STOP switch to STOP prior to turning MAIN POWER off.

When you want to shut down your system, perform the procedure given below. If the system is in the session environment, begin with Step 1. If not, proceed to Step 2.

STEP 1. SHUT-DOWN SESSION MONITOR

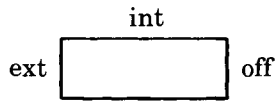
Ensure that there are no active sessions, then perform the shut-down procedure as described in the RTE-IVB System Manager's Reference Manual.

STEP 2. SET RUN/STOP SWITCH

To unload the heads from the disc before powering the system down, set the RUN/STOP switch on the front of the disc unit to STOP. Then, if desired, remove the disc cartridge from the drive and close the door. It takes approximately 30 seconds for the drive to stop turning and the door to unlock.

STEP 3. TURN OFF POWER-FAIL BATTERY

To prevent your power-fail battery from running down when you shut your system down, it must be shut off. Locate the battery box at the rear of the computer unit marked:



and set the switch to off.

STEP 4. TURN OFF MAIN POWER

If you have a vertical racked configuration, go to the front of the unit and locate the system ON/OFF switch in the upper right corner. Press this switch and the light will go out and power will be off.

If you have a desk configuration, go to the rear of the desk and locate the disc drive POWER switch and the computer MAIN power switch. These are located in the lower left corner of their respective units. Set these to OFF.

SYSTEM SHUT-DOWN SUMMARY

1. Shut-down Session Monitor (if used).
2. Set RUN/STOP switch to STOP.
3. Remove disc cartridge if desired.
4. Turn off power-fail battery.
5. Turn off MAIN power for disc drive and computer.

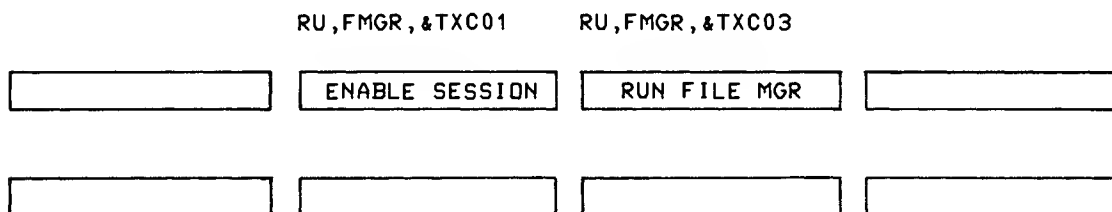
Chapter 3

GETTING ACQUAINTED WITH YOUR SYSTEM

PRIMARY SYSTEM OVERVIEW

Your system console comes with a set of eight keys (labeled f1 through f8) located on the upper right section of the keyboard. These are your softkeys which can be programmed to execute frequently used command strings with only one keystroke. This convenient feature saves time and can reduce errors when typing in commands. Each key can be configured to issue a command string of up to 80 characters.

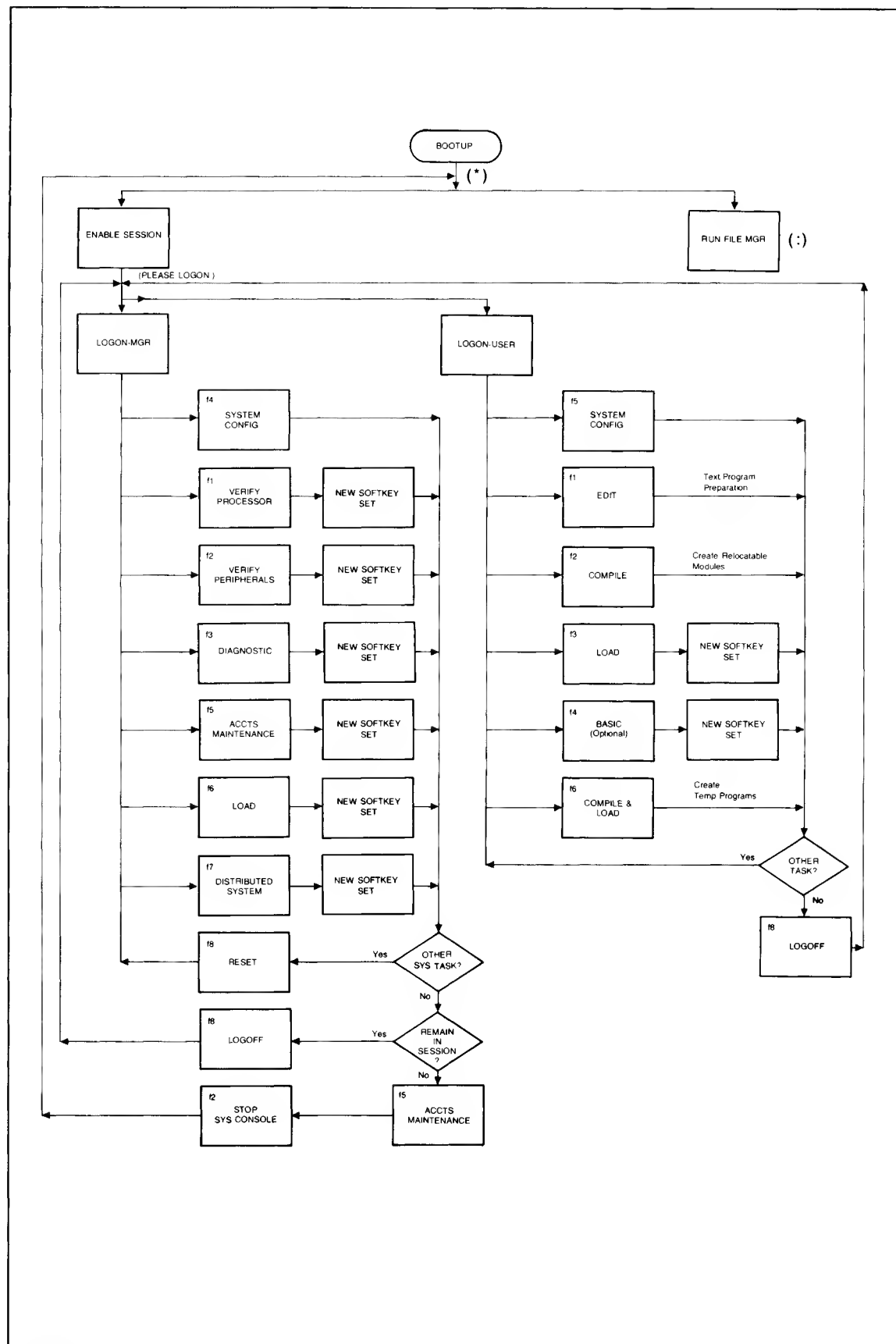
Many master softkey sets and subsets have been pre-defined in your Primary System to allow you to become familiar with both the softkeys and system operation. It is designed to provide you with a quick and easy means to learn system operations and to implement and test your applications. It gets you to the appropriate environment so that you may perform the desired task following instructions provided by the appropriate manuals from your manual set. After the system has been booted up, you should see:



Note that the command strings shown above the softkey labels are not displayed. For terminals without softkeys, these commands must be entered manually. The command strings are shown in all softkey labels illustrated in this chapter. At this point, you may select either the session or non-session environment. A simplified flowchart for each is shown in Figure 3-1 and Figure 3-2. The operations that have been configured in your Primary System are briefly explained in this chapter. Detailed information for certain operations can be found in the appropriate manuals. Before performing any tasks, be sure you are familiar with the procedures described in the following paragraphs in this section.

NOTE

Before pressing any softkey, you must get the appropriate prompt. Otherwise, your terminal may be locked up. If this occurs, press ONCE the black RESET TERMINAL key on the left corner of your keyboard to unlock the terminal. DO NOT press the reset key twice. Doing so erases the terminal memory and thus your terminal display and the softkey configuration.



7700-456

Figure 3-1. Session Softkey Functions

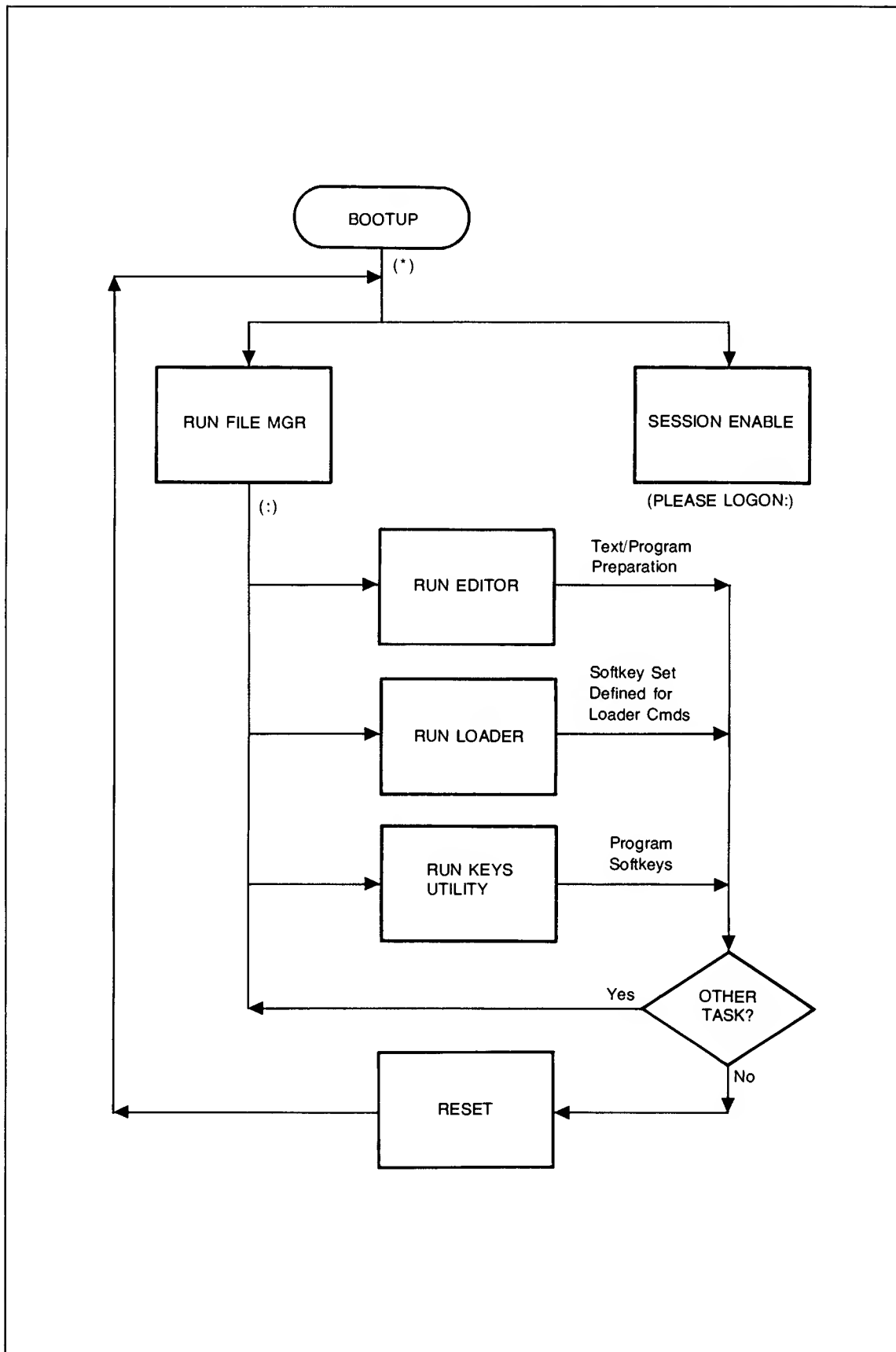


Figure 3-2. FMGR Softkey Operations

SYSTEM PROMPT

After bootup, the Primary System will be waiting for an interrupt. Get the attention of the system by pressing any key on your system console. An astrisk (*) prompt will be displayed. This is the system prompt. Now you may select the system environment, session or FMGR.

FILE MANAGER PROMPT

The File Manager prompt is a colon (:). It will be displayed if you press the RUN FILE MGR key after system startup. This prompt will also appear in the session environment after you have logged on as either general user or manager. The procedure for selecting any function indicated by the softkey display is the same as previously described. Refer to the NOTE about softkey lockup.

SESSION PROMPT

In the session environment, press any key to get the logon prompt:

PLEASE LOG-ON:

To initiate a session via the soft keys, you must logon as either the manager or the user. The logon procedure is described later in this chapter.

PROGRAM PROMPT

After selecting a particular system function, certain programs may be run to allow you to perform the selected task. The prompt for the individual program is described in the corresponding manual describing that program. Some common interactive programs are shown below. To get back to the softkey set to select another task, you must exit from the active program.

Program	Prompt	Exit
Editor	/	EC<namr> or : (or A to abort)
Loader	/LOADR:	/E
BASIC (optional)	>	BYE
REMAT (optional)	\$	EX

SOFTKEY ERROR RECOVERY

If you try to operate a softkey without the system FMGR or the session logon prompt, the keyboard on the console will lock up. To restore the terminal, press the black RESET TERMINAL key once.

If the RESET TERMINAL key is pressed twice, the softkey configuration on your terminal will be erased. To get the softkeys back, you can either restart your system or else enter the File Manager command string:

DU, &TXKM0,1	(system manager)	}	session
or			
DU, &TXKU0,1	(general user)		
or			
DU, &TXK04,1	(non-session)		

and the master set for each environment will be configured into your system console.

LOGICAL UNIT NUMBERS

In a control command, a numerical parameter, called a Logical Unit (LU) number, is used to address a particular Input/Output (I/O) device. Each such number is assigned to a specific device to be input (read) from or output (written) to. I/O devices are assigned LU numbers at system generation time, and the numbers are used thereafter to address each device.

LU numbers are decimal integers between 0 and 63. Numbers 1 through 6 are referred to as "standard LU's" and are generally assigned to the following devices (and are so assigned in your Primary System).

LU 1 System console (2645A or 2648A terminal)

LU 2 System mass storage (system disc)

LU 3 Auxiliary mass storage

LU 4 Left cartridge tape unit on system console

LU 5 Right cartridge tape unit on system console

LU 6 Standard list device (usually a line printer)

LU 0 is not associated with any particular device; it has a special purpose internal to the system. The remaining LU's (7-63) may be assigned to any type of device. In the Primary System some of these may be assigned to devices already. To see the Primary System LU assignments, press the softkey SYSTEM CONFIGURATION, in the SYSTEM STATUS set.

It is important to realize that you can reassign any LU number from one device to another, except LU 1, the system console and LU 2 or LU 3, the system discs. Reassigning LU's is useful when a particular output device is down for some reason or for the convenience of the user. The system console can have its LU number reassigned only if the second device can perform all the tasks of a system console. See the LU, and EQ control commands, in the RTE-IVB Terminal User's Reference Manual for the correct procedures to switch LU assignments.

SELECTING THE OPERATION ENVIRONMENT

Immediately after bootup, two softkeys are programmed to allow you to select the proper operating environment. You may select the session environment to take advantage of the Session Monitor features of the RTE-IVB software. A sample session account file has been established in your Primary System. You may also wish to simply run the File Manager. A few functions have been programmed into the softkeys for your convenience.

Press the space bar to get the "*" system prompt. Then press the ENABLE SESSION key f2 to place the system console in the session environment. A new softkey set is displayed to allow you to logon either as the system manager or a general user. You need a password to logon as the system manager. The password is HP and is programmed in key f5 which is unlabeled. The password entered will not be echoed for security reason. Upon successful logon, a master softkey set is displayed to allow you to select various functions. Operations provided in the session environment are described below.

If you have the HP 2621A or 2635A as the system console, the appropriate command strings are displayed (or printed). These commands are also given in the illustrations of the master softkey sets.

Press the space bar to get the "*" system prompt. Then press the RUN FILE MGR key f3 to run the File Manager. A master File Manager softkey set is programmed for your convenience. Operations provided in this set are described in this chapter.

LOGON - MGR

In the session environment, to log-on as the system manager, press the space bar to get the logon prompt "PLEASE LOG-ON:". Press the LOGON - MGR key (f2) or enter MANAGER.SYS. After the system prompts for a password, press key f5 or enter HP. You will not see the password on the display. Initially, the Primary System password is "HP". You may want to change it as soon as applicable. Refer to the RTE-IVB System Manager's Reference Manual for the procedure of changing the password.

SYSTEM MANAGER OPERATIONS

After successful log-on, the master system manager softkey set is displayed, see Figure 3-3, along with the File Manager prompt (:). Press the proper softkey corresponding to the function you wish performed. These operations are described below.

DU, &TXKM1, 1	DU, &TXKM2, 1	DU, &TXKM3, 1	RU, LUPRN, 1, AL
VERIFY PROCESSOR	VFY PERIPHERALS	DIAGNOSTICS	SYSTEM CONFIG
ACCOUNT MAINT.	LOAD	DISTRIBUTED SYS	LOGOFF
DU, &TXKM4, 1	TR, &TXCMB	TR, &TXCMC	TR, &TXCMA

Figure 3-3. Master System Manager Softkeys

SYSTEM CONFIGURATION

From the master system manager softkey set, press key f4 to check the system configuration. A sample configuration display is shown in Figure 3-4.

VERIFY PROCESSOR

From the master system manager softkey set, press key F1. The following softkey configuration will be displayed:

RU, TXPM0, 1, 1	TR, &TXCM1	RU, TXPF0, 1	RU, TXIB0, 1, 30
CPU	MEMORY	FIRMWARE	HP IB
			RESET
			DU, &TXKM0, 1

These functions are described in the 91711 Diagnostic and Verification Reference Manual (91711-90006). Note that some operations will display program aborted messages between tests. This is normal because of control transfer between the test programs and the File Manager.

Getting Acquainted With Your System

CONFIGURED MEMORY SIZE IS \$\$\$\$ K BYTES								
TIME BASE GENERATOR IS IN S.C. 11								
LU	EQT	S.CHNL	S.C.	QT	STATUS	DRIVER	DEVICE NAME	LU
1	2	0	15		B S	DV.05	2645/2648 TRMNL	1
2	1	0	14		D	DV.32	7906/20 DISC	2
3	*****	LU	UNASSIGNED	*****				3
4	2	1	15		B S	DV.05	2645/2648 TRMNL	4
5	2	2	15		B S	DV.05	2645/2648 TRMNL	5
6	2	0	15		B S	DV.05	2645/2648 TRMNL	6
7	*****	LU	UNASSIGNED	*****				7
8	*****	LU	UNASSIGNED	*****				8
9	3	1	12		PS	DV.65	DS/1000 LINK	9
10	1	1	14		D	DV.32	7906/20 DISC	10
11	1	2	14		D	DV.32	7906/20 DISC	11
12	1	3	14		D	DV.32	7906/20 DISC	12
13	1	4	14		D	DV.32	7906/20 DISC	13
14	1	5	14		D	DV.32	7906/20 DISC	14
15	1	6	14		D	DV.32	7906/20 DISC	15
16	*****	LU	UNASSIGNED	*****				16
17	*****	LU	UNASSIGNED	*****				17
18	*****	LU	UNASSIGNED	*****				18
19	*****	LU	UNASSIGNED	*****				19
20	*****	LU	UNASSIGNED	*****				20
21	*****	LU	UNASSIGNED	*****				21
22	*****	LU	UNASSIGNED	*****				22
23	*****	LU	UNASSIGNED	*****				23
24	*****	LU	UNASSIGNED	*****				24
25	*****	LU	UNASSIGNED	*****				25
26	*****	LU	UNASSIGNED	*****				26
27	*****	LU	UNASSIGNED	*****				27
28	*****	LU	UNASSIGNED	*****				28
29	*****	LU	UNASSIGNED	*****				29
30	*****	LU	UNASSIGNED	*****				30
31	*****	LU	UNASSIGNED	*****				31
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33	*****	LU	UNASSIGNED	*****				33
34	*****	LU	UNASSIGNED	*****				34
35	*****	LU	UNASSIGNED	*****				35
36	*****	LU	UNASSIGNED	*****				36
37	*****	LU	UNASSIGNED	*****				37
38	*****	LU	UNASSIGNED	*****				38
39	*****	LU	UNASSIGNED	*****				39
40	*****	LU	UNASSIGNED	*****				40
41	*****	LU	UNASSIGNED	*****				41
42	*****	LU	UNASSIGNED	*****				42
43	*****	LU	UNASSIGNED	*****				43
44	*****	LU	UNASSIGNED	*****				44
45	*****	LU	UNASSIGNED	*****				45
46	19	0	04			DV.43	PWR FAIL/SPOOL	46
47	*****	LU	UNASSIGNED	*****				47
48	*****	LU	UNASSIGNED	*****				48
49	*****	LU	UNASSIGNED	*****				49
50	*****	LU	UNASSIGNED	*****				50
51	*****	LU	UNASSIGNED	*****				51
52	*****	LU	UNASSIGNED	*****				52
53	*****	LU	UNASSIGNED	*****				53
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59	*****	LU	UNASSIGNED	*****				59
60	*****	LU	UNASSIGNED	*****				60
61	*****	LU	UNASSIGNED	*****				61
62	*****	LU	UNASSIGNED	*****				62
63	*****	LU	UNASSIGNED	*****				63

EQT STATUS LEGEND:

D= DMA REQUIRED
 B= AUTOMATIC OUTPUT BUFFERING USED
 P= DRIVER PROCESSES POWER FAIL
 S= DRIVER PROCESSES TIME-OUT
 T= DEVICE HAS TIMED OUT

Figure 3-4. Sample System Configuration

VERIFY PERIPHERALS

Press key f2 from the master system manager set to check the peripherals. The following softkey configuration will be displayed.

TR,&TSCM2	RU,TXMT0,1,8	RU,TXWL0,1,6	RU,TXTT0,1,1,4,5
DISC	MAG TAPE	LINE PRINTER	PTP TERMINALS
MP TERMINALS	DATA CAPTURE TRM	RS-232 TERMINALS	RESET
TR,&TXCM4	TR,&TXCM5	TR,&TXCM6	DU,&TXKM0,1

Note that certain tests are interactive. For example, the optional Data Capture Terminal test and the point-to-point terminals. In the Data Capture Terminal test, a list of the operator commands will be displayed. In the case of the point-to-point terminal test, a blank mini-cassette is required.

For more peripheral test information, refer to the 91711 Diagnostic and Verification Reference Manual.

RUN DIAGNOSTICS

Press key f3 from the master system manager softkey set to run the diagnostic tests. The following softkey configuration will be displayed.

RU,TXPF3,1,1	RU,TXPF1,1,1	RU,TXPF2,1,1	RU,TXPF4,1,1,1
EXTENDED MEMORY	FP PROCESSOR*	SCIENTIFIC INST*	VECTOR INST*
			RESET
			DU,&TXKM0,1

***CAUTION: Execute on F-Series only!**

Note that if you have the HP 2177C/D system, keys f1 through f4 and f8 are labeled. If you have the HP 2176C/D system, keys f2, f3, and f4 will be blank. For a complete check on the extended memory firmware, more than 96k bytes of memory is required. Otherwise, some tests are omitted with informative messages displayed. Refer to the 91711 Diagnostic and Verification Reference Manual for more diagnostic tests information.

RUN LOADER

To run the Loader Program, press key f6 from the master system manager softkey set. The following softkey configuration will be displayed as well as the loader prompt.

RU,LOADR	OP,	REL,	SE,
RUN LOADER	OP, opcode	RELOCATE, file	SEARCH, file
Undefined Refs?	END LOADER	ABORT LOADER	RESET
DI	EN	/A	DU,&TXKU0,1

Loader commands other than those programmed into the softkeys may be entered. Refer to the Interactive Loader chapter of the RTE-IVB Terminal User's Reference Manual for details.

DISTRIBUTED SYSTEM TEST

To test the optional Distributed System, press key f7 from the master system managers softkey set. The programmed softkey labels are displayed as follows:

RU,REMAT	LC	DL	LI,
RUN REMAT	LOCAL NODE #	NODE 1 DIRECTORY	LIST, file, lu
LIST/LOG DEVICES	SEND MESSAGE	VERIFY DS LINK	RESET
LL	TE,	TR,&TXCM3	TR,&TXCMD

Refer to the DS/1000 Manuals for detailed information.

SESSION ACCOUNT MAINTENANCE

Press key f5 from the master softkey set to run the ACCTS program. The following softkey definition will be displayed:

RU,ACCTS	TR,&TXCME	RU,ACCTS,&TXCMB	RU,ACCTS,&TXCM9
ONLINE USAGE	STOP SYS CONSOLE	LIST ALL GROUPS	LIST ALL USERS
			RESET
HP			DU,&TXKM0,1

You can exit from the session environment by pressing key f5 (STOP SYS CONSOLE). This will return the system to the system environment select stage (see Figure 3-1).

You may check the status of all users and groups by pressing keys f3 and f4 respectively.

To alter the account file, press key f1. The system will ask you for the system password, which is programmed into key f6 (HP unless you changed it). The program prompt "NEXT?" will be displayed.

To get a summary of the ACCTS Program commands, enter HE (HELP). Refer to the Maintaining the Account System chapter of the RTE-IVB System Manager's Manual for details.

Exiting from the ACCTS program will return you to the account maintenance softkeys shown above. Press reset to return to the master system manager softkeys, see Figure 3-3.

LOGON-USER

To log-on as a general system user in the session environment press the LOGON-USER key or enter USER.SYS after the "PLEASE LOG-ON:" prompt. No password is required. A master user softkey set is programmed and the labels are displayed, see Figure 3-5.

RU,EDITR	RU,COMPL,&	TR,&TXCU1	TR,&TXCU2
EDIT	COMPILE	LOAD	BASIC
SYSTEM CONFIG	COMPILE & LOAD		LOGOFF
RU,LUPRN,1,AL	RU,CLOAD,&		TR,&TXCMA

Figure 3-5. Master User Softkey Set.

SESSION USER OPERATIONS

To perform any of the functions indicated by the master user softkey set, press the appropriate softkey. These operations are briefly described below. Refer to the RTE-IVB Terminal User's Reference Manual for more information.

CHECK SYSTEM CONFIGURATION

Check system configuration by pressing key f5. The system resources such as line printer, cassette units, etc., are accessed by the same LU number even at different terminals. A sample system configuration is shown on Figure 3-4.

TEXT/PROGRAM PREPARATION

Run the Editor Program to prepare or modify text files or source programs. Press EDIT key f1.

After the Editor prompt and the source file request are displayed, enter a 0 (zero) and then carriage return.

You may now enter your text or program statements. Refer to the Getting Acquainted with RTE-IVB or the Interactive Editor chapter of the RTE-IVB Terminal User's Reference Manual. Note that if you wish to exit from the Editor without entering any text, you must enter a colon (:) prompt. Normal exit is either creating or replacing a file. You should begin the name of all program source files with an ampersand (&) in order to take advantage of some of the automatic functions of the interactive utilities COMPL and CLOAD. You may also abort the Editor with the A command if there is text on the work file.

CREATE RELOCATABLE FILES

To create relocatable files, run the compiler program by means of the COMPILE key f2. You will see:

```
:RU,COMPL,&
```

with the screen cursor immediately after the ampersand. You can enter the source program name and the desired Compiler parameters. Refer to the RTE-IVB Terminal User's Reference Manual for details.

LOAD AND RUN PROGRAMS

Use the LOAD key f3 to obtain the Loader program prompt (/LOADR:). Enter REL <relo file name>CR then END after the next Loader prompt.

When your program has been successfully loaded, terminate the Loader program with /END. If necessary, save your temporary program with the SP command. If not, you must reload your program the next time you logon to the system.

You may execute your program with the RUN (RU) command.

Refer to the RTE-IVB Terminal User's Reference Manual for more information on the loader and the operator commands.

COMPILE AND LOAD PROGRAMS

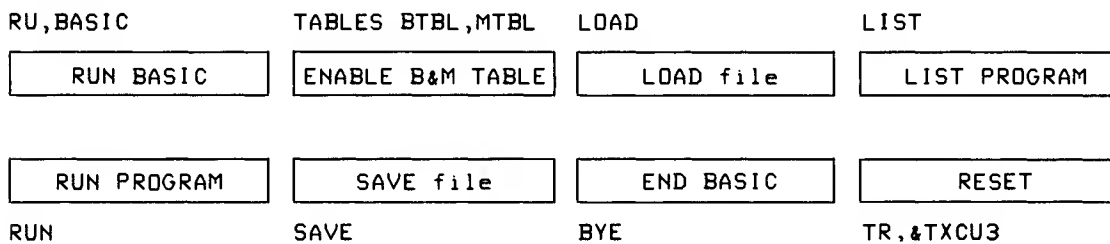
When you are developing a program, you may want to ensure that the syntax is correct by running the compiler. Then run your program to ensure your logic is correct. If you are reasonably sure that there are no errors in your program, you may want to compile and load your program in one step. Do this with the COMPILE & LOAD key f6. You will see:

```
:RU,CLOAD,&
```

with the cursor positioned after the ampersand, enter the source program file name and press return. Your program will be compiled and loaded. When your program has been loaded, control is returned to the File Manager with the colon (:) prompt displayed. Next, execute your program with the RUN (RU) command. Refer to the RTE-IVB Terminal User's Reference Manual for more information.

RUN BASIC

To run the optional BASIC program, press key f4 from the master user softkey set (see Figure 3-5). A new set of softkeys is provided to perform some of the BASIC operations. The BASIC softkeys are shown below. Refer to the BASIC/1000 Reference Manual for detailed information on BASIC.



RUN FILE MGR

If the RUN FILE MGR softkey is pressed when the environment-select softkey set is displayed, the File Manager softkey definition is displayed. See Figure 3-6 for the softkey labels. A flowchart of these functions is shown in Figure 3-2.

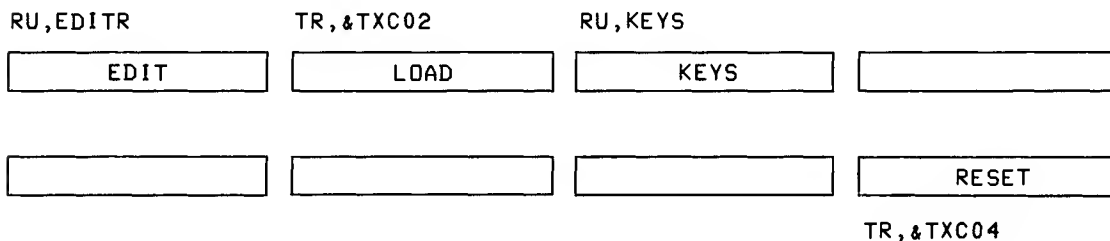


Figure 3-6. File Manager Softkey Labels.

Running the Editor and Loader programs is as described in the session environment. The Keys utility program is described in the RTE-IVB Terminal User's Reference Manual.

Chapter 4

CUSTOMIZING YOUR SYSTEM

INTRODUCTION

The full range of features and capabilities of the HP 1000 System is available to the System Manager. After performing the operations given in Chapter 3, you may wish to tailor the system to your needs. You may want to add or decrease the number of programs to be executed concurrently in the system, change the system I/O or memory configuration, generate a new operating system, etc. For considerations in planning and changing your system, and system modifications and expansions, refer to the RTE-IVB System Manager's Reference Manual.

RECONFIGURING YOUR SYSTEM

The RTE-IVB operating system contains a program that can be scheduled at boot-up (system start up) to allow reconfiguration of your system's Input/Output (I/O), and memory, without performing an entire regeneration of your system. This allows you to adapt your generated system to the physical I/O configuration in an existing system. The reconfigurator program also allows you to change the size of System Available Memory (SAM), alter the program partition requirements, and repartition the system to avoid bad pages of memory. These changes can either be temporary, changing the memory resident copy of the operating system, or permanent by changing the system on the disc as well as the memory resident copy.

For instruction on the use of the reconfigurator, refer to the I/O and memory reconfiguration chapter in the RTE-IVB System Manager's Reference Manual. If you are already familiar with the reconfigurator, refer to Appendix B in this manual for instructions on the register settings to enable the reconfigurator.

GENERATING YOUR OWN SYSTEM

When you have become familiar with the HP 1000 system through the use of the Primary System, you may want to generate a new operating system tailored to your specific requirements. System generation consists of building an operating system by collecting and organizing various software modules, which include RTE-IVB and various user programs necessary for a particular application. The result is a computer system with its memory and peripheral devices configured to meet your specific requirements. This system also contains the resources (programs and files) necessary for your particular application.

To perform a generation, follow these steps:

1. Study the RTE-IVB On-Line Generator Reference Manual and Chapter 3 of the RTE-IVB System Manager's Reference Manual, to become familiar with the procedures required to generate a system.
2. Plan your new system in detail by deciding which software modules to include and what your I/O and memory structure will be like, using the guidelines in the RTE-IVB System Manager's Reference Manual. Fill out the worksheets mentioned and illustrated in the RTE-IVB System Manager's Reference Manual.
3. If your system has only 64k of memory, certain restrictions apply to the type of system you will be able to configure and generate. The only type of system smaller than the RTE-IVB Primary System is one without any of the DS/1000 modules currently generated into it. Reconfiguring such a system leaves about 25k of memory, whereas, with the DS/1000 subsystem generated in, you have only 19k. You should not generate a system with more subsystems or drivers or both than currently generated into an RTE-IVB Primary System with only 64k of memory, since that would leave less than 19k of memory in which to load and run user and system programs.
4. Fill out the generation worksheets in the manuals and use them to modify a copy of the existing Primary System answer file residing on the Primary System disc, or to create an answer file that contains the answers to the queries of RT4GN, the RTE-IVB On-Line Generator.
5. If you have a 7906 disc subsystem, use the Primary System disc cartridge as the source of your software modules and run RT4GN storing the system file in a file on the fixed platter that will remain when you take the Primary System cartridge out. It is recommended that on completion of your generation, you should have a copy of your software archives on your Primary System disc cartridge, and your new system on the second or third cartridge supplied with the system. This arrangement saves the Primary System software modules (stored on LU 10) for future generations, and gives you a storage medium for one or two copies of your new operating system.
6. When you have generated your new system file you must put it on your target disc in order to use it. To do this, use the SWTCH program, which transfers the system in your system file to a target disc. Refer to the RTE-IVB System Manager's Reference Manual for instructions.

At this point set the RUN/STOP switch to STOP and remove the Primary System disc cartridge. Then insert your system disc cartridge and set the switch to RUN. When the DRIVE READY indicator lights, continue with SWTCH.

7. If you have the 7920/25 disc subsystem, generate your system using the Primary System disc pack as the source for your software modules. Put your system file on one of the alternate logical cartridges of the pack (not on the same logical cartridge as your software archives). When RT4GN is finished, transfer this file to your back up device. Then remove the Primary System disc pack and insert your disc pack. At this point your Primary System should be backed up on your system back-up device. Now copy the system file to one of the logical cartridges on your disc pack, and run SWTCH on the file to put it on the correct place on the disc.

FREEING PROGRAM ID SEGMENTS

Each program loaded on-line requires an ID segment, which is a 34-word array that the system uses to identify a program. Your Primary System has approximately 5 free long ID segments for use by programs loaded on-line. This means that you can have 5 extra programs at one time that are loaded and ready to be executed. However, you may want to have more temporary programs available for concurrent execution. This can be done by using the afile Manager to store these programs.

SAVING TEMPORARY PROGRAMS

When you are finished executing a temporarily loaded program and would like to save it and free its ID segment for use by other programs, get the FMGR prompt (:) and type

```
: SP<program>(CR)
```

where:

SP is the FMGR, "save program" operator command

<program> is the name of the program to be saved.

(CR) is carriage return

The program will be stored in a File Manager file. Now type

```
: OF , <program>(CR)
```

where:

OF is the FMGR command to "off" the program. This releases the program's ID segment.

The program is now saved in a File Manager file and its ID segment is available to some other program loaded on-line.

Saved programs can be executed by the File Manager. An ID segment is temporarily assignee to the program and automatically released after the program terminates.

To restore an ID segment to the program so that it can be executed under operating system control, type

```
: RP , <program name>(CR)
```

where:

RP is the FMGR command that restores the program's ID segment, so that the RTE-IVB operating system will once again recognize the existence of the program.

To keep some ID segments free, use the SP command to save the program, and then use the OF command to free the ID segment.

For further explanation of the SP and RP commands, see the File Manager Command section of the RTE-IVB Terminal User's Reference Manual.

PURGING FILES

As you develop your programs or applications, you often create new files and update old ones. It is useful to be able to delete all but the current files to keep your records up to date. To purge a file you no longer need, type

```
:PU,namr(CR)
```

where:

PU is the FMGR command to purge a file from the system.

namr is the name (and location) of the file to be purged.

Now that the program is stored in a FMGR file, the relocatable binary file, prefaced with %, is no longer needed, so type

```
:PU,%xxxx(CR)
```

where:

%xxxx is the file name of the relocatable binary code.

This command will permanently remove a file from the system. This is the command you would use to remove a program saved in a type 6 file from the system if that was necessary. You may recover the disc space by using the PK command.

For additional information on the FMGR commands, refer to the RTE-IVB Terminal User's Reference Manual.

Appendix A

BOOT-UP TROUBLESHOOTING

INTRODUCTION

To start up your system, be sure all the components are set up as described below then follow the SHUT DOWN procedure, wait 5-10 seconds, and follow the SYSTEM START-UP procedure given in this manual. If you continue to have trouble, check the installation manual for the proper configuration of your system.

DISC DRIVE

Check that the disc drive POWER switch at the rear of the disc drive unit is set to ON.

Check the unit number of the drive. You should see a 0 displayed next to the drive indicator lights. If not, open the grill on the front of the disc drive unit (7906) by pushing the bottom of the grill in. Locate the rotary LU SELECT switch, and set it to 0.

COMPUTER POWER

2176C AND 2177C, VERTICALLY RACKED MODEL

Check that the computer is plugged in and the ON/OFF switch on the front, upper right corner of the cabinet is depressed, and lit. This indicates that power is on to the system.

2176D AND 2177D, DESK MODEL

Check that the computer is plugged in and the ~POWER switch at the rear of the computer in the lower left corner is set to ON.

2176E AND 2177F, VERTICALLY RACKED MODEL

Check that the computer is plugged in and the ON/OFF switch on the rear center of the cabinet is set to ON.

2176 AND 2177C/D, BOTH CONFIGURATIONS

If the keys to the computer are available to unlock the front door and the front panel of the computer at your installation, do so. Inside you will see two switches labeled



Set the LOCK/OPERATE switch to LOCK for auto boot-up, and the ~ POWER switch to ON, then close and lock the front panel of the computer. At this point, a few of the register lights on the front panel of the computer should be lit.

TERMINAL POWER

Press twice the RESET TERMINAL key on the upper left side of the keyboard. TERMINAL READY should be displayed on the screen. If not, check to be sure the terminal is plugged in, then check that the power switch under the rear door of the terminal is set to ON.

Check that the REMOTE key, just below the RESET TERMINAL key, is depressed. If not, press it and it will lock in the depressed position.

POWER FAIL BATTERY

Be sure the Power Fail Battery and the battery cable or the Battery Load Simulator Plug are attached at the rear of the computer and plugged into the BATT INPUT plug.

REGISTER HALTS

IF you are still unable to start up your system, check the front panel of the computer. Displayed in the register you will see an octal halt code. For the explanation of this code see the Loader ROM Installation Manual.

Appendix B

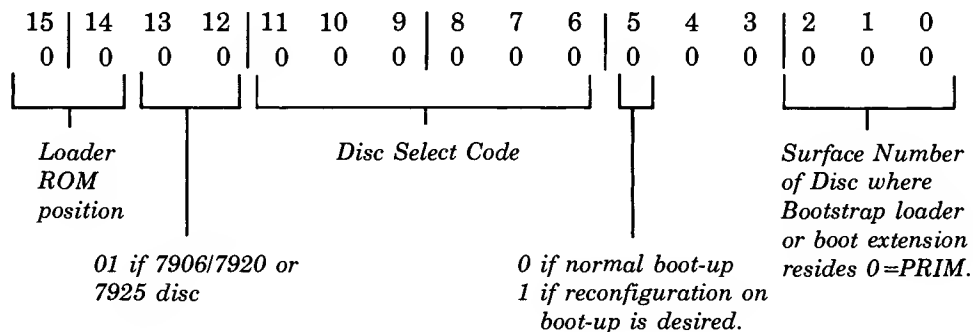
MANUAL SYSTEM START-UP PROCEDURE

MANUAL START-UP

The procedure below assumes that the system power and all devices are on, as described in Chapter 2, "System Start-up and Shut-down".

To start up your HP 1000 manually, follow this procedure.

1. Open the front door of the cabinet containing the computer with the key provided.
2. Open the front panel of the CPU with the key provided and set the LOCK/OPERATE switch inside to OPERATE.
3. Close the front panel.
4. Press the HALT switch.
5. Display the S register by pressing the register select switch until the indicator light is over the S label.
6. Press the clear display switch.
7. Enter the following numbers into the Display Register.



8. Press the STORE switch.
9. Press the PRESET, IBL, PRESET and then the RUN switches.
10. If bit 5 was NOT set, and the procedure has been followed correctly, your RTE-IV Primary System is now running. Proceed to Chapter 3, "Getting Acquainted with Your System".

If you chose to reconfigure your system (bit 5 was set) you will see 102077 displayed in the Display Register. To continue with the reconfiguration, follow the procedure below.

RECONFIGURATION

1. Display the S Register as described above, and press the Clear Display switch.
2. Enter the following numbers into the S Register

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Enter 1				Disc select code						System console select code					

Disc select code: given in the Primary System answer file. A summary of the register settings is given in Table B-1.

System console select code: given in the Primary System answer file.

3. Press the STORE switch.
4. Press the PRESET switch and then the RUN switch.
5. The configurator program now has control and will display the message

START RECONFIGURATION
LIST DEVICE LU#?

on the system console.

To perform the reconfiguration, follow the instructions given in Chapter 9 of the RTE-IVB System Manager's Reference Manual.

Table B-1. Primary System Register Settings

PRIMARY SYSTEM #	5	6	7	8
Disc Select code (octal)	13	13	14	14
System console Select code (octal)	14	14	15	15
Loader ROM Position	3	3	3	3
Boot Extension Bootstrap loader Disc Surface Number	0	0	0	0
Double Disc surface # (1=no) (2=yes)	1	1	1	1

APPENDIX C

RESTORING SOFTWARE ONTO DISC

To restore the 92068A update software supplied on either minicartridges or magnetic tape onto a disc cartridge in the RTE-IVB operating system, proceed as follows:

1. Log on to the RTE-IVB system.
2. If you are using minicartridge tapes, load the first one into the cassette tape unit (CTU) of your terminal and find out the session logical unit (LU) number of the CTU. If you are using magnetic tape, mount a reel into the tape drive, and find out its LU number. Typically, the left CTU is LU 4, the right CTU is LU 5, and the magnetic tape drive is LU 8. Your system manager should know the session LU assignment.
3. Run the READR program and enter the interactive READR commands as shown below. The user entries are underlined. The READR program prompt is "Command?". You also need to know the cartridge reference number (crn) of the disc cartridge to which your software is to be restored.

:RU,READR

COMMAND? MT, <u>lu</u>	Parameter <u>lu</u> is the logical unit number of the CTU where the minicartridge (or magnetic tape) is located.
------------------------	--

COMMAND? DC, <u>crn</u>	Specifies the disc cartridge reference number (<u>crn</u>) where the files are to be restored.
-------------------------	--

COMMAND? OS, <u>n</u>	Assigns a new security code (<u>n</u>) or changes the one already assigned. Otherwise, this entry may be omitted.
-----------------------	---

COMMAND? AL	Specifies that all the files on the minicartridge (or magnetic tape) will be restored. Note that the first file (TR0000) is a directory of all the files on the minicartridge (or magnetic tape).
-------------	---

COMMAND? /E	Starts the restoring process. Restoring Software onto Disc.
-------------	---

COMMAND?	Restoration completed.
----------	------------------------

4. If you are restoring from magnetic tape, remove the tape from the drive, and exit READR by entering the command "/A". You have finished. If you are restoring from minicartridge tapes, remove the minicartridge tape, exit READR by entering the command "/A", and proceed to step 5.

Restoring Software Onto Disc

5. Repeat steps 2 through 4 for each of the remaining minicartridge tapes. The tape directory files of all minicartridges have the same name (TR0000). READR displays the error message, "duplicate file name," and prompts for direction. Skip this file (by entering the command "SK") to continue restoring the 92068A software onto disc. A sample message and the response are shown below.

```
CREAT error    -2 on TR0000:      0:    EC
    /A, HElp, PUrge, ALter, OC,n, OS,n or SKip this file? SK
```

In the above example, the duplicate file error message displays the file name (TR0000), security code (0), and the CRN (EC). READR skips the directory file and restores the other files on this tape.

The READR commands can also be entered in the run string or in a command file. For more information, refer to the READR utility program description in the READR/SAVER Reference Manual.

GLOSSARY

ANSWER FILE - A file that contains a list of the responses to the On-Line Generator queries. These responses must be ordered in the same sequence as the generator queries. The file may be a disc file or a logical unit (e.g., a mini-cartridge, magnetic tape, or a paper tape device).

AUTO BOOT-UP - A feature that automatically starts up the computer when the system is powered up.

BOOTSTRAP LOADER - A program produced by the on-line generator that loads the Boot Extension into memory and then transfers control to the Boot Extension.

BOOT-UP - The process of bringing the Bootstrap Loader or ROM Loader contents into memory. Control is then transferred to the Boot Extension to begin the initialization process.

CARTRIDGE - See **LOGICAL CARTRIDGE** or **DISC CARTRIDGE**.

COMMON - An area of memory that can be accessed by a program and its subprograms. Usually used to pass data from a program to a subprogram. In RTE, system COMMON may be used to pass data from one program to another.

COMPUTER - The main processor of a computer system (the Central Processing Unit; CPU). It is the unit which performs the computations and controls overall system operation.

COMPUTER SYSTEM - The CPU, peripherals and software interfaced to work together to perform data manipulation, I/O, and storage tasks.

CONFIGURATOR - A two-part program that allows reconfiguration of an RTE system's I/O and physical memory structures without going through a new system generation. The configurator is initiated as an option during the start-up process.

DIRECTORY - A list of programs and files currently stored on a disc subchannel that can be displayed by the user.

DISC - Strictly speaking, the term means the platters with the storage medium only; however the term is also loosely used to mean the entire peripheral, including the drive.

DISC-BASED - Refers to an operating system using a disc storage device as an integral part of the operating system.

DISC CARTRIDGE - The removable cartridge that comes with a 7900 or 7906 disc subsystem, for example. It is also referred to as the removable platter.

DISC-RESIDENT - A term applied to programs in executable form (absolute) that are stored on disc and brought into main memory for execution by the system in response to a program or operator request, time-of-day schedule or an I/O interrupt.

DOWN - The status of a device or I/O controller that is not available for use.

DRIVER - A software module that interfaces a device and its controller to an operating system.

FILE - A defined section of memory on a mass storage device (usually a magnetic disc) where data or programs are stored.

GLOSSARY (continued)

FIRMWARE - A set of microcoded routines, permanently stored in ROMs in the system.

ID SEGMENT - A block of words associated with each resident program that is used by the system to keep track of the program's name, software priority field, current scheduling status and other characteristics. Each resident program must have its own ID segment.

I/O (INPUT/OUTPUT) - A general term referring to any activity between a computer and its peripheral devices.

LIST DEVICE - The peripheral device to which listings are directed for output, usually a line printer or terminal.

LOADING - A process that converts the relative addresses of relocatable programs to absolute addresses compatible with the memory layout of a particular system.

LOGICAL CARTRIDGE - A group of contiguous tracks on a disc addressed as a unit through LU numbers or CR (cartridge reference) numbers.

LOGICAL UNIT NUMBER (LU) - A number used by a program to refer to an I/O device. Programs do not refer directly to the physical I/O device select code number, but rather through the LU number that has a cross-reference to the device.

MAIN PROCESSOR - See **COMPUTER**

OFF-LINE - Refers to the use of the computer or I/O devices by resources other than the RTE operating system or subsystems.

ON-LINE - Refers to software or I/O devices recognized and controlled by the main operating system at the time they are being used.

OPERATING SYSTEM - An organized collection of programs designed to optimize the usage of a computer system. It provides the means by which user programs interact with hardware and other software.

OPERATOR COMMAND - A command addressed to the currently controlling program (for example FMGR) by the operator.

PAGE - The largest block of memory (1024 words) that can be directly addressed by the address field of a one-word memory reference instruction.

PARTITION - A predefined block of memory with a fixed number of pages (redefinable at system bootup) located in the disc resident program area of memory. Disc resident programs run in partitions and at least one partition of sufficient size must be defined during system generation to run disc resident programs.

PERIPHERAL TESTS - A set of test configured into the Primary System set of softkeys. These tests are designed to test the peripheral devices included in the Primary System.

POWER FAIL/AUTO RESTART - The ability of a computer system to save the current state of the system in permanent memory when power is lost and to restore the system to defined conditions when power returns.

PRIMARY SYSTEM - An RTE operating system configured to run with the principal parts of an ordered system immediately on installation.

GLOSSARY (continued)

PROMPT - The character displayed by a program to indicate that it is waiting for input. FMGR uses a colon prompt (:).

SOFTKEYS - The set of programmable keys on each terminal keyboard. These are configured in the Primary System to perform various functions and tests in the system.

START-UP - The start-up process is initiated by the Boot Extension. During the start-up process, the tables, registers and pointers required by the system are established.

SYSTEM CONSOLE - The interactive console or terminal (LU 1) that controls system operation and to which all system and some utility error messages are issued. In a multi-terminal environment, a system console is distinguished from "user consoles" from which users develop programs.

SYSTEM DISC CARTRIDGE - The disc cartridge that contains a copy of the Primary System and the relocatable software modules used to update your software.

SYSTEM GENERATION - A process using the On-line generator and an existing RTE operating system to build a new operating system. This uses the relocatable software modules found on LU 10 of the system disc. This new system can then be transferred to the desired location on a disc and then control can be transferred to the new system, all through a program called **SWTCH**.

SYSTEM TESTS - A set of tests configured into the Primary System set of softkeys designed to test the computer system.

UP - The status of a device or I/O controller that is available for use.

READER COMMENT SHEET

GETTING STARTED WITH YOUR PRIMARY SYSTEM

92068-90023

January 1983

Update No. _____
(If Applicable)

We welcome your evaluation of this manual. Your comments and suggestions help us improve our publications. Please use additional pages if necessary.

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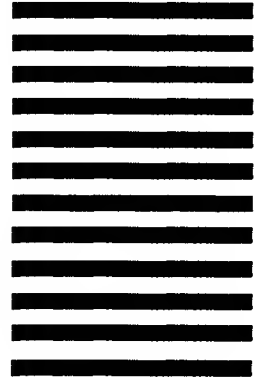
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SALES & SUPPORT OFFICES

Arranged Alphabetically by Country



Product Line Sales/Support Key

Key Product Line

A	Analytical
CM	Components
C	Computer Systems Sales only
CH	Computer Systems Hardware Sales and Services
CS	Computer Systems Software Sales and Services
E	Electronic Instruments & Measurement Systems
M	Medicel Products
MP	Medical Products Primary SRO
MS	Medical Products Secondary SRO
P	Personal Computation Products
.	Sales only for specific product line
..	Support only for specific product line

IMPORTANT: These symbols designate general product line capability. They do not insure sales or support availability for all products within a line, at all locations. Contact your local sales office for information regarding locations where HP support is available for specific products.

HP distributors are printed in italics.

ANGOLA

Telecra
Empresa Técnica de Equipamentos
Eléctricos, S.A.R.L.
R. Barbosa Rodrigues, 41-I DT.
Caixa Postal 6487
LUANDA
Tel: 355 15, 355 16
E,M,P

ARGENTINA

Hewlett-Packard Argentina S.A.
 Avenida Santa Fe 2035
 Martinez 1640 BUENOS AIRES
 Tel: 798-5735, 792-1293
 Telex: 17595 BIONAR
 Cable: HEWPARG
 A,E,CH,CS,P

Biotron S.A.C.I.M. e I.
Av Paseo Colon 221, Piso 9
1399 BUENOS AIRES,
Tel: 30-4846, 30-1851
Telex: 17595 BIONAR
M

Fate S.A. I.C.I. Electronica
Venezuela 1326
1095 BUENOS AIRES
Tel: 37-9020, 37-9026/9
Telex: 9234 FATEN AR
P

AUSTRALIA

Adelaide, South Australia Office

Hewlett-Packard Australia Ltd.
 153 Greenhill Road
 PARKSIDE, S.A. 5063
 Tel: 272-5911
 Telex: 82536
 Cable: HEWPARD Adelaide
 A*,CH,CM,E,MS,P

Brisbane, Queensland Office

Hewlett-Packard Australia Ltd.
 49 Park Road
MILTON, Queensland 4064
 Tel: 229-1544
 Telex: 42133
 Cable: HEWPARD Brisbane
 A,CH,CM,E,M,P
 Effective November 1, 1982:
 10 Payne Road
THE GAP, Queensland 4061
 Tel: 30-4133
 Telex: 42133

Canberra, Australia Capital Territory Office

Hewlett-Packard Australia Ltd.
 121 Wollongong Street
FYSHWICK, A.C.T. 2609
 Tel: 80 4244
 Telex: 62650
 Cable: HEWPARD Canberra
 CH,CM,E,P

Melbourne, Victoria Office

Hewlett-Packard Australia Ltd.
 31-41 Joseph Street
BLACKBURN, Victoria 3130
 Tel: 877 7777
 Telex: 31-024
 Cable: HEWPARD Melbourne
 A,CH,CM,CS,E,MS,P

Perth, Western Australia Office

Hewlett-Packard Australia Ltd.
 261 Stirling Highway
CLAREMONT, W.A. 6010
 Tel: 383-2188
 Telex: 93859
 Cable: HEWPARD Perth
 A,CH,CM,E,MS,P

Sydney, New South Wales Office

Hewlett-Packard Australia Ltd.
 17-23 Talavera Road
 P.O. Box 308
NORTH RYDE, N.S.W. 2113
 Tel: 887-1611
 Telex: 21561
 Cable: HEWPARD Sydney
 A,CH,CM,CS,E,MS,P

AUSTRIA

Hewlett-Packard Ges.m.b.H.
 Grottenhofstrasse 94
 Verkaufsburo Graz
A-8052 GRAZ
 Tel: 291-5-66
 Telex: 32375
 CH,E*
 Hewlett-Packard Ges.m.b.H.
 Stanglhofweg 5
A-4020 LINZ
 Tel: 0732 51585
 CH
 Hewlett-Packard Ges.m.b.H.
 Liebigasse 1
 P.O. Box 72
A-1222 VIENNA
 Tel: (0222) 23-65-11-0
 Telex: 134425 HEPA A
 A,CH,CM,CS,E,MS,P

BAHRAIN

Green Salon
P.O. Box 557
BAHRAIN
Tel: 255503-255950
Telex: 844 19
P
Wael Pharmacy
P.O. Box 648
BAHRAIN
Tel: 256123
Telex: 8550 WAEI BN
M, E

BELGIUM

Hewlett-Packard Belgium S.A./N.V.
 Blvd de la Woluwe, 100
 Woluwedal
B-1200 BRUSSELS
 Tel: (02) 762-32-00
 Telex: 23-494 paloben bru
 A,CH,CM,CS,E,MP,P

BRAZIL

Hewlett-Packard do Brasil L.e.C. Ltda.
 Alameda Rio Negro, 750
 Alphaville 06400 BARUERI SP
 Tel: (11) 421-1311
 Telex: 01 133872 HPBR-BR
 Cable: HEWPARG Sao Paulo
 A,CH,CM,CS,E,M,P
 Hewlett-Packard do Brasil L.e.C. Ltda.
 Avenida Epitacio Pessoa, 4664
 22471 RIO DE JANEIRO-RJ
 Tel: (21) 286-0237
 Telex: 021-21905 HPBR-BR
 Cable: HEWPARG Rio de Janeiro
 A,CH,CM,E,MS,P*

CANADA

Alberta
 Hewlett-Packard (Canada) Ltd.
 210, 7220 Fisher Street S.E.
CALGARY, Alberta T2H 2H8
 Tel: (403) 253-2713
 A,CH,CM,E*,MS,P*
 Hewlett-Packard (Canada) Ltd.
 11620A-168th Street
EDMONTON, Alberta T5M 3T9
 Tel: (403) 452-3670
 A,CH,CM,CS,E,MS,P*

British Columbia

Hewlett-Packard (Canada) Ltd.
 10691 Shellbridge Way
RICHMOND,
 British Columbia V6X 2W7
 Tel: (604) 270-2277
 Telex: 610-922-5059
 A,CH,CM,CS,E*,MS,P*

Manitoba

Hewlett-Packard (Canada) Ltd.
 380-550 Century Street
WINNIPEG, Manitoba R3H 0Y1
 Tel: (204) 786-6701
 A,CH,CM,E,MS,P*

New Brunswick

Hewlett-Packard (Canada) Ltd.
 37 Sheadiac Road
MONCTON, New Brunswick E2B 2V0
 Tel: (506) 855-2841
 CH**

Nova Scotia

Hewlett-Packard (Canada) Ltd.
 P.O. Box 931
 900 Windmill Road
DARTMOUTH, Nova Scotia B2Y 3Z6
 Tel: (902) 469-7820
 CH,CM,CS,E*,MS,P*

Ontario

Hewlett-Packard (Canada) Ltd.
 552 Newbold Street
LONDON, Ontario N6E 2S5
 Tel: (519) 686-9181
 A,CH,CM,E*,MS,P*
 Hewlett-Packard (Canada) Ltd.
 6877 Goreway Drive
MISSISSAUGA, Ontario L4V 1M8
 Tel: (416) 678-9430
 A,CH,CM,CS,E,MP,P
 Hewlett-Packard (Canada) Ltd.
 2670 Queensview Dr.
OTTAWA, Ontario K2B 8K1
 Tel: (613) 820-6483
 A,CH,CM,CS,E*,MS,P*
 Hewlett-Packard (Canada) Ltd.
 220 Yorkland Blvd., Unit #11
WILLOWDALE, Ontario M2J 1R5
 Tel: (416) 499-9333
 CH

Quebec

Hewlett-Packard (Canada) Ltd.
 17500 South Service Road
 Trans-Canada Highway
KIRKLAND, Quebec H9J 2M5
 Tel: (514) 697-4232
 A,CH,CM,CS,E,MP,P*
 Hewlett-Packard (Canada) Ltd.
 Les Galeries du Vallon
 2323 Du Versant Nord
STE. FOY, Quebec G1N 4C2
 Tel: (418) 687-4570
 CH

CHILE

Jorge Calcagni y Cia. Ltda.
Arturo Surhle 065
Casilla 16475
SANTIAGO 9
Tel: 222-0222
Telex: Public Booth 440001
A,CM,E,M
Olympia (Chile) Ltda.
Av. Rodrigo de Araya 1045
Casilla 256-V
SANTIAGO 21
Tel: 2-25-50-44
Telex: 340-892 OLYMP CK
Cable: Olympiachile Santiagochile
 CH,CS,P

CHINA, People's Republic of

China Hewlett-Packard Rep. Office
P.O. Box 418
1A Lane 2, Luchang St.
Beiwai Rd., Xuanwu District
BENJING
Tel: 33-1947, 33-7426
Telex: 22601 CTSHP CN
Cable: 1920
 A,CH,CM,CS,E,P

COLOMBIA

Instrumentación
H. A. Langebaek & Kier S.A.
Carrera 7 No. 48-75
Apartado Aereo 6287
BOGOTA 1, O.E.
Tel: 287-8877
Telex: 44400 INST CO
Cable: AARIS Bogota
 A,CM,E,M,PS,P

COSTA RICA

Cientifica Costarricense S.A.
Avenida 2, Calle 5
San Pedro de Montes de Oca
Apartado 10159
SAN JOSE
Tel: 24-38-20, 24-08-19
Telex: 2367 GALGUR CR
 CM,E,MS,P

CYPRUS

Telecrea Ltd.
P.O. Box 4809
14C Stassinios Avenue
NICOSIA
Tel: 62698
Telex: 2894 LEVIOO CY
 E,M,P

DENMARK

Hewlett-Packard A/S
 Datavej 52
DK-3460 Birkerød
 Tel: (02) 81-66-40
 Telex: 37409 hpas dk
 A,CH,CM,CS,E,MS,P
 Hewlett-Packard A/S
 Navervej 1
DK-8600 SILKEBORG
 Tel: (06) 82-71-66
 Telex: 37409 hpas dk
 CH,E

ECUADOR

CYEDE Cia. Ltda.
Avenida Eloy Alfaro 1749
Casilla 6423 CCI
QUITO
Tel: 450-975, 243-052
Telex: 2548 CYEODE EO
 A,CM,E,P
Hospitalar S.A.
Robles 625
Casilla 3590
QUITO
Tel: 545-250, 545-122
Telex: 2485 HOSPTEL EO
 Cable: HOSPITALAR-Quito
 M

EGYPT

International Engineering Associates
 24 Hussein Hegazi Street
Kasr-el-Aini
CAIRO
Tel: 23829, 21641
Telex: IEA UN 93830
 CH,CS,E,M
Informatic For Systems
 22 Talaat Harb Street
CAIRO
Tel: 759006
Telex: 93938 FRANK UN
 CH,CS,P
Egyptian International Office
for Foreign Trade
P.O. Box 2558
CAIRO
Tel: 650021
Telex: 93337 EGPOR
 P

EL SALVADOR

IPESA de El Salvador S.A.
 29 Avenida Norte 1216
SAN SALVADOR
 Tel: 26-6858, 26-6868
 Telex: Public Booth 20107
 A,CH,CM,CS,E,P

FINLAND

Hewlett-Packard Oy
 Revontulentie 7
SF-02100 ESPOO 10
 Tel: (90) 455-0211
 Telex: 121563 hewpa sf
 A,CH,CM,CS,E,MS,P
 Hewlett-Packard Oy
 Aaloksenkatu 10-C



SALES & SUPPORT OFFICES

Arranged Alphabetically by Country

SF-40720-72 JYASKYLA
Tel: (941) 216318
CH

Hewlett-Packard Oy
Kainuntie 1-C
SF-90140-14 OULU
Tel: (981) 3387B5
CH

FRANCE

Hewlett-Packard France
Z.I. Mercure B
Rue Berthelot
F-13763 Les Milles Cedex
AUX-EN-PROVENCE
Tel: (42) 59-41-02
Telex: 410770F
A,CH,E,MS,P*

Hewlett-Packard France
Boite Postale No. 503
F-25026 BESANCON
2B Rue de la Republique
F-25000 BESANCON
Tel: (81) B3-16-22
CH,M

Hewlett-Packard France
Bureau de Vente de Lyon
Chemin des Mouilles
Boite Postale 162
F-69130 ECULLY Cédex
Tel: (7) B33-81-25
Telex: 310617F
A,CH,CS,E,MP

Hewlett-Packard France
Immeuble France Evry
Tour Lorraine
Boulevard de France
F-91035 EVRY Cédex
Tel: (6) 077-96-60
Telex: 692315F
E

Hewlett-Packard France
5th Avenue Raymond Chanas
F-38320 EYBENS
Tel: (76) 25-81-41
Telex: 980124 HP GRENBO EYBE
CH

Hewlett-Packard France
Centre d'Affaire Paris-Nord
Bâtiment Ampère 5 étage
Rue de la Commune de Paris
Boite Postale 300
F-93153 LE BLANC MESNIL
Tel: (01) 865-44-52
Telex: 211032F
CH,CS,E,MS

Hewlett-Packard France
Parc d'Activités Cadera
Quartier Jean Mermoz
Avenue du Président JF Kennedy
F-33700 MERIGNAC
Tel: (56) 34-00-B4
Telex: 550105F
CH,E,MS

Hewlett-Packard France
32 Rue Lothaire
F-57000 METZ
Tel: (B) 765-53-50
CH

Hewlett-Packard France
Immeuble Les 3 B
Nouveau Chemin de la Garde
Z.A.C. de Bois Briand
F-44085 NANTES Cedex
Tel: (40) 50-32-22
CH**

Hewlett-Packard France
Zone Industrielle de Courtaboeuf
Avenue des Tropiques
F-91947 Les Ulis Cédex ORSAY
Tel: (6) 907-78-25
Telex: 600048F
A,CH,CM,CS,E,MP,P

Hewlett-Packard France
Paris Porte-Maillet
15, Avenue Oe L'Amiral Bruix
F-75782 PARIS 16
Tel: (1) 502-12-20
Telex: 613663F
CH,MS,P

Hewlett-Packard France
2 Allée de la Bourgonette
F-35100 RENNES
Tel: (99) 51-42-44
Telex: 740912F
CH,CM,E,MS,P*

Hewlett-Packard France
98 Avenue de Bretagne
F-76100 ROUEN
Tel: (35) 63-57-66 CH** ,CS

Hewlett-Packard France
4 Rue Thomas Mann
Boite Postale 56
F-67200 STRASBOURG
Tel: (BB) 28-56-46
Telex: B90141F
CH,E,MS,P*

Hewlett-Packard France
Péricentre de la Céprière
F-31081 TOULOUSE Cedex
Tel: (61) 40-11-12
Telex: 531639F
A,CH,CS,E,P*

Hewlett-Packard France
Immeuble Péricentre
F-59658 VILLENEUVE D'ASCQ Cedex
Tel: (20) 91-41-25
Telex: 160124F
CH,E,MS,P*

GERMAN FEDERAL REPUBLIC

Hewlett-Packard GmbH
Technisches Büro Berlin
Keithstrasse 2-4
0-1000 BERLIN 30
Tel: (030) 24-90-B6
Telex: 018 3405 hpbln d
A,CH,E,M,P

Hewlett-Packard GmbH
Technisches Büro Böblingen
Herrenberger Strasse 110
0-7030 BOBLINGEN
Tel: (07031) 667-1
Telex: bbn or
A,CH,CM,CS,E,MP,P

Hewlett-Packard GmbH
Technisches Büro Ousseldorf
Emanuel-Leutze-Strasse 1
0-4000 DUSSELDORF
Tel: (0211) 5971-1
Telex: 085/86 533 hpdd d
A,CH,CS,E,MS,P

Hewlett-Packard GmbH
Vertriebszentrale Frankfurt
Berner Strasse 117
Postfach 560 140
0-6000 FRANKFURT 56
Tel: (0611) 50-04-1
Telex: 04 13249 hpffm d
A,CH,CM,CS,E,MP,P

Hewlett-Packard GmbH
Technisches Büro Hamburg
Kapsladtrung 5
0-2000 HAMBURG 60
Tel: (040) 63804-1
Telex: 021 63 032 hphd d
A,CH,CS,E,MS,P

Hewlett-Packard GmbH
Technisches Büro Hannover
Am Grossmarkt 6
0-3000 HANNOVER 91
Tel: (0511) 46-60-01
Telex: 092 3259
A,CH,CM,E,MS,P

Hewlett-Packard GmbH
Technisches Büro Mannheim
Rosslauer Weg 2-4
0-6800 MANNHEIM
Tel: (0621) 70050
Telex: 0462105
A,C,E

Hewlett-Packard GmbH
Technisches Büro Neu Ulm
Messerschmittstrasse 7
0-7910 NEU ULM
Tel: 0731-70241
Telex: 07 12B16 HP ULM-0
A,C,E*

Hewlett-Packard GmbH
Technisches Büro Nürnberg
Neumeyerstrasse 90
0-8500 NÜRNBERG
Tel: (0911) 52 20 B3-87
Telex: 0623 860
CH,CM,E,MS,P

Hewlett-Packard GmbH
Technisches Büro München
Eschenstrasse 5
0-8028 TAUFKIRCHEN
Tel: (089) 6117-1
Telex: 0524985
A,CH,CM,E,MS,P

GREAT BRITAIN

Hewlett-Packard Ltd.
Trafalgar House
Navigation Road
ALTRINCHAM
Cheshire WA14 1NU
Tel: (061) 928-6422
Telex: 66B068
A,CH,CS,E,M

Hewlett-Packard Ltd.
Oakfield House, Oakfield Grove
Clifton
BRISTOL BS8 2BN, Avon
Tel: (027) 38606
Telex: 444302
CH,M,P

Hewlett-Packard Ltd.
(Pinewood)
Nine Mile Ride
EASTHAMPTSTEAD
Wokingham
Berkshire, RG11 3LL
Tel: 3446 3100
Telex: 84-88-05
CH,CS,E

Hewlett-Packard Ltd.
Fourier House
257-263 High Street
LONDON COLNEY
Herts., AL2 1HA, St. Albans
Tel: (0727) 24400
Telex: 1-B952716
CH,CS,E

Hewlett-Packard Ltd.
Tradax House, St. Mary's Walk
MAIDENHEAD
Berkshire, SL6 1ST
Tel: (0628) 39151
CH,CS,E,P

Hewlett-Packard Ltd.
Oudangle
106-118 Station Road
REDHILL, Surrey
Tel: (0737) 68655
Telex: 947234 CH,CS,E

Hewlett-Packard Ltd.
Avon House
435 Stratford Road
SHIRLEY, Solihull
West Midlands B90 4BL
Tel: (021) 745 8800
Telex: 339105
CH

Hewlett-Packard Ltd.
West End House 41
High Street, West End
SOUTHAMPTON
Hampshire SO3 30Q
Tel: (703) 886767
Telex: 477138
CH

Hewlett-Packard Ltd.
King Street Lane
WINNERSH, Wokingham
Berkshire RG11 5AR
Tel: (0734) 784774
Telex: 847 178
A,CH,E,M

GREECE

Kostas Karayannis S.A.
B Omirou Street
ATHENS 133
Tel: 32 30 303, 32 37 371
Telex: 215962 RKAR GR
A,CH,CM,CS,E,M,P

PLAISIO S.A.
G. Gerardos
24 Stournara Street
ATHENS
Tel: 36-11-160
Telex: 221871
P

GUATEMALA

IPESA
Avenida Reforma 3-4B, Zona 9
GUATEMALA CITY
Tel: 316627, 314786
Telex: 4192 TEL TRO GU
A,CH,CM,CS,E,M,P

HONG KONG

Hewlett-Packard Hong Kong, Ltd.
G.P.O. Box 795
5th Floor, Sun Hung Kai Centre
30 Harbour Road
HONG KONG
Tel: 5-8323211
Telex: 66678 HEWPA HX
Cable: HEWPACK HONG KONG
E,CH,CS,P

CET Ltd.
1402 Tung Way Mansion
199-203 Hennessy Rd.
Wanchia, HONG KONG
Tel: 5-729376
Telex: B514B CET HX
CM
Schmidt & Co. (Hong Kong) Ltd.
Wing On Centre, 28th Floor
Connaught Road, C.
HONG KONG
Tel: 5-455644
Telex: 74766 SCHMX HX
A,M

ICELAND

Elding Trading Company Inc.
Hafnarvöll Tryggvagötu
P.O. Box 895
IS-REYKJAVIK
Tel: 1-5B-20, 1-63-03
M

INDIA

Blue Star Ltd.
Sabri Complex II Floor
24 Residency Rd.
BANGALORE 560 025
Tel: 55660
Telex: 0845-430
Cable: BLUESTAR
A,CH,CM,CS,E

Blue Star Ltd.
Band Box House
Prabhadevi
BOMBAY 400 025
Tel: 422-3101
Telex: 011-3751
Cable: BLUESTAR
A,M
Blue Star Ltd.
Sahas
414/2 Vir Savarkar Marg
Prabhadevi
BOMBAY 400 025
Tel: 422-6155
Telex: 011-4093
Cable: FROSTBLUE
A,CH,CM,CS,E,M
Blue Star Ltd.
Kalyan, 19 Vishwas Colony
Akrapuri, BORODA, 390 005
Tel: 65235
Cable: BLUE STAR
A
Blue Star Ltd.
7 Hare Street
CALCUTTA 700 001
Tel: 12-01-31
Telex: 021-7655
Cable: BLUESTAR
A,M
Blue Star Ltd.
133 Kodambakkam High Road
MADRAS 600 034
Tel: B2057
Telex: 041-379
Cable: BLUESTAR
A,M
Blue Star Ltd.
8handari House, 7th/8th Floors
91 Nehru Place
NEW DELHI 110 024
Tel: 6B2547
Telex: 031-2463
Cable: BLUESTAR
A,CH,CM,CS,E,M
Blue Star Ltd.
15/16-C Wellesley Rd.
PUNE 411 011
Tel: 22775
Cable: BLUE STAR
A
Blue Star Ltd.
2-2-47/110B Bolarum Rd.
SECUNDERABAD 500 003
Tel: 72057
Telex: 0155-459
Cable: BLUEFROST
A,E
Blue Star Ltd.
T.C. 7/603 Poornima
Maruthankuzhi
TRIVANDRUM 695 013
Tel: 65799
Telex: 0884-259
Cable: BLUESTAR
E

Blue Star Ltd.
133 Kodambakkam High Road
MADRAS 600 034
Tel: B2057
Telex: 041-379
Cable: BLUESTAR
A,M
Blue Star Ltd.
8handari House, 7th/8th Floors
91 Nehru Place
NEW DELHI 110 024
Tel: 6B2547
Telex: 031-2463
Cable: BLUESTAR
A,CH,CM,CS,E,M
Blue Star Ltd.
15/16-C Wellesley Rd.
PUNE 411 011
Tel: 22775
Cable: BLUE STAR
A
Blue Star Ltd.
2-2-47/110B Bolarum Rd.
SECUNDERABAD 500 003
Tel: 72057
Telex: 0155-459
Cable: BLUEFROST
A,E
Blue Star Ltd.
T.C. 7/603 Poornima
Maruthankuzhi
TRIVANDRUM 695 013
Tel: 65799
Telex: 0884-259
Cable: BLUESTAR
E

INDONESIA

BERCA Indonesia P.T.
P.O.Box 496/JKT.
Jl. Abdul Muis 62
JAKARTA
Tel: 373009
Telex: 4674B BERSAL IA
Cable: BERSAL JAKARTA
P
BERCA Indonesia P.T.
Wisma Antara Bldg., 17th floor
JAKARTA
A,CS,E,M
BERCA Indonesia P.T.
P.O. Box 174/SBY.
Jl. Kutei No. 11
SURABAYA
Tel: 68172
Telex: 31146 BERSAL SB
Cable: BERSAL-SURABAYA
A*,E,M,P

IRAQ

Hewlett-Packard Trading S.A.
Service Operation
Al Mansoor City 98/3/7
BAGHDAD
Tel: 551-49-73
Telex: 212-455 HEPAIRAQ IK
CH,CS

IRELAND

Hewlett-Packard Ireland Ltd.
82/83 Lower Leeson St.
DUBLIN 2
Tel: (1) 60 88 00
Telex: 30439
A,CH,CM,CS,E,M,P
Cardiac Services Ltd.
Kilmore Road
Artane
DUBLIN 5
Tel: (01) 351820
Telex: 30439
M

ISRAEL

Eldan Electronic Instrument Ltd.
P.O. Box 1270
JERUSALEM 91000
16, Ohaliav St.
JERUSALEM 94467
Tel: 533 221, 553 242
Telex: 25231 AB/PAKRD IL
A

Electronics Engineering Division
Motorola Israel Ltd.
16 Kremenetski Street
P.O. Box 25016
TEL-AVIV 67899
Tel: 3-338973
Telex: 33569 Motil IL
Cable: BASTEL Tel-Aviv
CH,CM,CS,E,M,P

ITALY

Hewlett-Packard Italiana S.p.A.
Traversa 99C
Via Giulio Petroni, 19
I-70124 BARI
Tel: (080) 41-07-44
M

Hewlett-Packard Italiana S.p.A.
Via Martin Luther King, 38/111
I-40132 BOLOGNA
Tel: (051) 402394
Telex: 511630
CH,E,MS

Hewlett-Packard Italiana S.p.A.
Via Principe Nicola 43G/C
I-95126 CATANIA
Tel: (095) 37-10-87
Telex: 970291
C,P

Hewlett-Packard Italiana S.p.A.
Via G. Di Vittorio 9
I-20063 CERNUSCO SUL NAVIGLIO
Tel: (2) 903691
Telex: 334632

A,CH,CM,CS,E,MP,P
Hewlett-Packard Italiana S.p.A.
Via Nuova San Rocco a
Capodimonte, 62/A
I-80131 NAPLES
Tel: (081) 7413544
Telex: 710698

A,CH,E
Hewlett-Packard Italiana S.p.A.
Viale G. Modugno 33
I-16156 GENOVA PEGLI
Tel: (010) 68-37-07
Telex: 215238
E,C

Hewlett-Packard Italiana S.p.A.
Via Turazza 14
I-35100 PADDVA
Tel: (049) 664888
Telex: 430315
A,CH,E,MS

Hewlett-Packard Italiana S.p.A.
Viale C. Pavese 340
I-00144 ROMA
Tel: (06) 54831
Telex: 610514
A,CH,CM,CS,E,MS,P*

Hewlett-Packard Italiana S.p.A.
Corso Svizzera, 184
I-10149 TORINO
Tel: (011) 74 4044
Telex: 221079
CH,E

JAPAN

Yokogawa-Hewlett-Packard Ltd.
Inoue Building
1-21-8, Asahi-cho
ATSUGI, Kanagawa 243
Tel: (0462) 28-0451
CM,C*,E

Yokogawa-Hewlett-Packard Ltd.
Towa Building
2-2-3, Kaigandori, Chuo-ku
KOBE, 650, Hyogo
Tel: (078) 392-4791
C,E

Yokogawa-Hewlett-Packard Ltd.
Kumagaya Asahi Yasoji Bldg 4F
3-4 Chome Tsukuba
KUMAGAYA, Saitama 360
Tel: (0485) 24-6563
CH,CM,E

Yokogawa-Hewlett-Packard Ltd.
Asahi Shinbun Dai-ichi Seimei Bldg.,
2F
4-7 Hanabata-cho
KUMAMOTO-SH, 860
Tel: (0963) 54-7311
CH,E

Yokogawa-Hewlett-Packard Ltd.
Shin Kyolo Center Bldg. 5F
614 Siokoji-cho
Nishiruhigashi, Karasuma
Siokoji-dori, Shimogyo-ku
KYOTO 600
Tel: 075-343-0921
CH,E

Yokogawa-Hewlett-Packard Ltd.
Mito Mitsui Building
1-4-73, San-no-maru
MITO, Ibaragi 310
Tel: (0292) 25-7470
CH,CM,E

Yokogawa-Hewlett-Packard Ltd.
Sumitomo Seimei Nagoya Bldg.
2-14-19, Meieki-Minami,
Nakamura-ku
NAGOYA, 450 Aichi
Tel: (052) 571-5171
CH,CM,CS,E,MS

Yokogawa-Hewlett-Packard Ltd.
Chuo Bldg., 4th Floor
5-4-20 Nishinakajima,
Yodogawa-ku
OSAKA, 532
Tel: (06) 304-6021
Telex: YHPOSA 523-3624
A,CH,CM,CS,E,MP,P*

Yokogawa-Hewlett-Packard Ltd.
1-27-15, Yabe,
SAGAMIHARA Kanagawa, 229
Tel: 0427 59-1311
Yokogawa-Hewlett-Packard Ltd.
Shinjuku Oai-ichi Seimei 6F
2-7-1, Nishi Shinjuku
Shinjuku-ku, TOKYO 160
Tel: 03-348-4611-5
CH,E

Yokogawa-Hewlett-Packard Ltd.
3-29-21 Takaido-Higashi
Suginami-ku TOKYO 168
Tel: (03) 331-6111
Telex: 232-2024 YHPTOK
A,CH,CM,CS,E,MP,P*
Yokogawa-Hewlett-Packard Ltd.
Oaiichi Asano Building 4F
5-2-8, Oodori,
UTSUNOMIYA, 320
Tochigi
Tel: (0286) 25-7155
CH, CS, E

Yokogawa-Hewlett-Packard Ltd.
Yasudaseimei Yokohama
Nishiguchi Bldg.
3-30-4 Tsuruya-cho
Kanagawa-ku
YOKOHAMA, Kanagawa, 221
Tel: (045) 312-1252
CH,CM,E

JORDAN

Mouasher Cousins Company
P.O. Box 1387
AMMAN
Tel: 24907, 39907
Telex: 21456 SABCO JO
CH,E,M,P

KENYA

ADCOM Ltd., Inc., Kenya
P.O. Box 30070
NAIROBI
Tel: 331955
Telex: 22639
E,M

KOREA

Samsung Electronics Computer
Division
76-561 Yeoksam-Dong
Kangnam-Ku
C.P.O. Box 2775
SEOUL
Tel: 555-7555, 555-5447
Telex: K27364 SAMSAN
A,CH,CM,CS,E,M,P

KUWAIT

Al-Khaldiya Trading & Contracting
P.O. Box 830 Safat
KUWAIT
Tel: 42-4910, 41-1726
Telex: 22481 Areeg kt
CH,E,M
Photo & Cine Equipment
P.O. Box 270 Safat
KUWAIT
Tel: 42-2846, 42-3801
Telex: 22247 Matin-KT
P

LEBANON

G.M. Dolmadjian
Achrafieh
P.O. Box 165.167
BEIRUT
Tel: 290293
MP**

LUXEMBOURG

Hewlett-Packard Belgium S.A./N.V.
Blvd de la Woluwe, 100
Woluwedal
8-1200 BRUSSELS
Tel: (02) 762-32-00
Telex: 23-494 paloben bru
A,CH,CM,CS,E,MP,P

MALAYSIA

Hewlett-Packard Sales (Malaysia)
Sdn. 8hd.
1st Floor, Bangunan British
American
Jalan Semantan, Oamansara Heights
KUALA LUMPUR 23-03
Tel: 943022
Telex: MA31011
A,CH,E,M,P*
Protel Engineering
Lot 319, Satok Road
P.O. Box 1917
Kuching, SARAWAK
Tel: 53544
Telex: MA 70904 PROMAL
Cable: PROTELENG
A,E,M

MALTA

Philip Toledo Ltd.
Notabile Rd.
MRIEHEL
Tel: 447 47, 455 66
Telex: 649 Media MW
P

MEXICO

Hewlett-Packard Mexicana, S.A. de
C.V.
Av. Periferico Sur No. 6501
Tepepan, Xochimilco
MEXICO D.F. 16020
Tel: 676-4600
Telex: 17-74-507 HEWPAC MEX
A,CH,CS,E,MS,P
Effective November 1, 1982:
Hewlett-Packard Mexicana, S.A. de
C.V.
Ejercito Nacional #570
Colonia Granada
11560 MEXICO, O.F.
CH**
Hewlett-Packard Mexicana, S.A. de
C.V.
Rio Volga 600
Pte. Colonia del Valle
MONTERREY, N.L.
Tel: 78-42-93, 78-42-40, 78-42-41
Telex: 038-2410 HPMTY ME
CH
Effective Nov. 1, 1982
Ave. Colonia del Valle #409
Col. del Valle
Municipio de garza garcia
MONTERREY, N.V.

ECISA
Taihe 229, Piso 10
Polanco MEXICO D.F. 11570
Tel: 250-5391
Telex: 17-72755 ECE ME
M

MOROCCO

Dolbeau
81 rue Karatchi
CASABLANCA
Tel: 3041-82, 3068-38
Telex: 23051, 22822
E
Gerep
2 rue d'Agadir
Boite Postale 156
CASABLANCA
Tel: 272093, 272095
Telex: 23 739
P

NETHERLANDS

Hewlett-Packard Nederland 8.V.
Van Heuven Goedhartlaan 121
NL 1181KK AMSTELVEEN
P.O. Box 667
NL 1180 AR AMSTELVEEN
Tel: (20) 47-20-21
Telex: 13 216
A,CH,CM,CS,E,MP,P

Hewlett-Packard Nederland 8.V.
Bongerd 2
NL 2906VK CAPPELLE, A/D IJssel
P.O. Box 41
NL 2900 AA CAPPELLE, IJssel
Tel: (10) 51-64-44
Telex: 21261 HEPAC NL
A,CH,CS

NEW ZEALAND

Hewlett-Packard (N.Z.) Ltd.
169 Manukau Road
P.O. Box 26-189
Epsom, AUCKLAND
Tel: 687-159
Cable: HEWPAC Auckland
CH,CM,E,P*
Hewlett-Packard (N.Z.) Ltd.
4-12 Cruickshank Street
Kilbirnie, WELLINGTON 3
P.O. Box 9443
Courtenay Place, WELLINGTON 3
Tel: 877-199
Cable: HEWPAC Wellington
CH,CM,E,P

Northrop Instruments & Systems
Ltd.

369 Khyber Pass Road
P.O. Box 8602
AUCKLAND
Tel: 794-091
Telex: 60605
A,M

Northrop Instruments & Systems
Ltd.

110 Mandeville St.
P.O. Box 8388
CHRISTCHURCH
Tel: 486-928
Telex: 4203
A,M

Northrop Instruments & Systems
Ltd.

Sturdee House
85-87 Ghuznee Street
P.O. Box 2406
WELLINGTON
Tel: 850-091
Telex: NZ 3380
A,M

NORTHERN IRELAND

Cardiac Services Company
95A Finaghy Road South
BELFAST BT 10 OBY
Tel: (0232) 625-566
Telex: 747626
M

NORWAY

Hewlett-Packard Norge A/S
Folke Bernadottes vei 50
P.O. Box 3558
N-5033 FYLLINGSDALEN (Bergen)
Tel: (05) 16-55-40
Telex: 16621 hpnas n
CH,CS,E,MS
Hewlett-Packard Norge A/S
Østerdalen 18
P.O. Box 34
N-1345 ØSTERÅS
Tel: (02) 17-11-80
Telex: 16621 hpnas n
A,CH,CM,CS,E,M,P

OMAN

Khimji Ramdas
P.O. Box 19
MUSCAT
Tel: 722225, 745601
Telex: 3289 BROKER MB MUSCAT
P



SALES & SUPPORT OFFICES

Arranged Alphabetically by Country

Suhail & Saud Bahwan
P.O. Box 169
MUSCAT
Tel: 734 201-3
Telex: 3274 BAHWAN MB

PAKISTAN
Mushko & Company Ltd.
1-B, Street 43
Sector F-8/1
ISLAMABAD
Tel: 26875
Cable: FEMUS Rawalpindi
A,E,M
Mushko & Company Ltd.
Oosman Chambers
Abdullah Haroon Road
KARACHI 0302
Tel: 511027, 512927
Telex: 2894 MUSKO PK
Cable: COOPERATOR Karachi
A,E,M,P*

PANAMA
Electrónico Balboa, S.A.
Calle Samuel Lewis, Ed. Alfa
Apartado 4929
PANAMA 5
Tel: 64-2700
Telex: 3483 ELECTRON PG
A,CM,E,M,P
Foto Internacional, S.A.
Colon Free Zone
Apartado 2068
COLON 3
Tel: 45-2333
Telex: B626 IMPORT PG
P

PERU
Cía Electro Médica S.A.
Los Flamencos 145, San Isidro
Casilla 1030
LIMA 1
Tel: 41-4325, 41-3703
Telex: Pub. Booth 25306
A,CM,E,M,P

PHILIPPINES
The Online Advanced Systems Corporation
Rico House, Amoroso Cor. Herrera
Street
Legaspi Village, Makati
P.O. Box 1510
Metro MANILA
Tel: 85-35-81, 85-34-91, 85-32-21
Telex: 3274 ONLINE
A,CH,CS,E,M
Electronic Specialists and Proponents Inc.
690-B Epifanio de los Santos
Avenue
Cubao, QUEZON CITY
P.O. Box 2649 Manila
Tel: 98-96-81, 98-96-82, 98-96-83
Telex: 40018, 42000 ITT GLOBE
MACKAY BOOTH
P

PORTUGAL
Mundinter
Intercambio Mundial de Comércio
S.a.r.l
P.O. Box 2761
Av. Antonio Augusto de Aguiar 138
P-LISBON
Tel: (19) 53-21-31, 53-21-37
Telex: 16691 munter p
M

Soquimica
Av. da Liberdade, 220-2
1298 LISBON Codex
Tel: 56 21 B1/2/3
Telex: 13316 SABASA P
Telectra-Empresa Técnica de Equipamentos Eléctricos S.a.r.l.
Rua Rodrigo da Fonseca 103
P.O. Box 2531
P-LISBON 1
Tel: (19) 68-60-72
Telex: 12598
CH,CS,E,P

PUERTO RICO
Hewlett-Packard Puerto Rico
P.O. Box 4407
CAROLINA, Puerto Rico 00628
Calle 272 Edificio 203
Urb. Country Club
RIO PIEDRAS, Puerto Rico 00924
Tel: (809) 762-7255
A,CH,CS

QATAR
Nasser Trading & Contracting
P.O. Box 1563
DOHA
Tel: 22170, 23539
Telex: 4439 NASSER DH
M
Computearbia
P.O. Box 2750
DOHA
Tel: 883555
Telex: 4806 CHPARB
P
Eastern Technical Services
P.O. Box 4747
DOHA
Tel: 329 993
Telex: 4156 EASTEC DH

SAUDI ARABIA
Modern Electronic Establishment
Hewlett-Packard Division
P.O. Box 281
Thuobah AL-KHOBAR
Tel: 864-46 78
Telex: 671 106 HPMEEK SJ
Cable: ELECTA AL-KHOBAR
CH,CS,E,M,P
Modern Electronic Establishment
Hewlett-Packard Division
P.O. Box 1228
Redec Plaza, 6th Floor
JEDDAH
Tel: 644 3B 4B
Telex: 402712 FARNAS SJ
Cable: ELECTA JEDDAH
CH,CS,E,M,P
Modern Electronic Establishment
Hewlett-Packard Division
P.O. Box 272B
RIYADH
Tel: 491-97 15, 491-63 87
Telex: 202049 MEERYO SJ
CH,CS,E,M,P

SCOTLAND
Hewlett-Packard Ltd.
Royal Bank Buildings
Swan Street
BRECHIN, Angus, Scotland
Tel: (03562) 3101-2
CH
Hewlett-Packard Ltd.
SOUTH QUEENSFERRY
West Lothian, EH30 9GT
GB-Scotland
Tel: (031) 3311188
Telex: 72682
A,CH,CM,CS,E,M

SINGAPORE
Hewlett-Packard Singapore (Pty.) Ltd.
P.O. Box 58 Alexandra Post Office
SINGAPORE, 9115
6th Floor, Inchcape House
450-452 Alexandra Road
SINGAPORE 0511
Tel: 631788
Telex: HPSGSO RS 34209
Cable: HEWPACK, Singapore
A,CH,CS,E,MS,P
Oynamar International Ltd.
Unit 05-11 Block 6
Kolam Ayer Industrial Estate
SINGAPORE 1334
Tel: 747-6188
Telex: RS 26283
CM

SOUTH AFRICA
Hewlett-Packard So Africa (Pty.) Ltd.
P.O. Box 120
Howard Place
Pine Park Center, Forest Drive,
Pinelands
CAPE PROVINCE 7405
Tel: 53-7954
Telex: 57-20006
A,CH,CM,E,MS,P
Hewlett-Packard So Africa (Pty.) Ltd.
P.O. Box 37099
92 Overport Drive
DURBAN 4067
Tel: 28-4178, 28-4179, 28-4110
Telex: 6-22954
CH,CM
Hewlett-Packard So Africa (Pty.) Ltd.
6 Linton Arcade
511 Cape Road
Linton Grange
PORT ELIZABETH 6001
Tel: 041-302148
CH

Hewlett-Packard So Africa (Pty.) Ltd.
P.O. Box 33345
Glenstantia 0010
TRANSVAAL
1st Floor East
Constantia Park Ridge Shopping
Centre
Constantia Park
PRETORIA
Tel: 982043
Telex: 32163
CH,E
Hewlett-Packard So Africa (Pty.) Ltd.
Private Bag Wendywood
SANDTON 2144
Tel: 802-5111, 802-5125
Telex: 4-20877
Cable: HEWPACK Johannesburg
A,CH,CM,CS,E,MS,P

SPAIN
Hewlett-Packard Española S.A.
c/Entenza, 321
E-BARCELONA 29
Tel: (3) 322-24-51, 321-73-54
Telex: 52603 hpbce
A,CH,CS,E,MS,P
Hewlett-Packard Española S.A.
c/San Vicente S/N
Edificio Albia II, 7 B
E-BILBAO 1
Tel: (4) 23-8306, (4) 23-8206
A,CH,E,MS
Hewlett-Packard Española S.A.
Calle Jerez 3
E-MADRID 16
Tel: (1) 458-2600
Telex: 23515 hpe
A,CM,E

Hewlett-Packard Española S.A.
c/o Costa Brava 13
Colonia Mirasierra
E-MADRID 34
Tel: (1) 734-8061, (1) 734-1162
CH,CS,M
Hewlett-Packard Española S.A.
Av Ramón y Cajal 1-9
Edificio Sevilla 1,
E-SEVILLA 5
Tel: 64-44-54, 64-44-58
Telex: 72933
A,CS,MS,P
Hewlett-Packard Española S.A.
C/Ramon Gordillo, 1 (Entlo.3)
E-VALENCIA 10
Tel: 361-1354, 361-1358
CH,P

SWEDEN
Hewlett-Packard Sverige AB
Sunnanvagen 14K
S-22226 LUND
Tel: (046) 13-69-79
Telex: (854) 17886 (via SPANGA office)
CH
Hewlett-Packard Sverige AB
Vastra Vintergatan 9
S-70344 ÖREBRO
Tel: (19) 10-48-80
Telex: (854) 17886 (via SPANGA office)
CH
Hewlett-Packard Sverige AB
Skalhögsgatan 9, Kista
Box 19
S-16393 SPANGA
Tel: (08) 750-2000
Telex: (854) 17886
A,CH,CM,CS,E,MS,P
Hewlett-Packard Sverige AB
Frötällsgatan 30
S-42132 VÄSTRA-FRÖLUNDA
Tel: (031) 49-09-50
Telex: (854) 17886 (via SPANGA office)
CH,E,P

SWITZERLAND
Hewlett-Packard (Schweiz) AG
Clarastrasse 12
CH-4058 BASLE
Tel: (61) 33-59-20
A
Hewlett-Packard (Schweiz) AG
Bahnhofweg 44
CH-3018 BERN
Tel: (031) 56-24-22
CH
Hewlett-Packard (Schweiz) AG
47 Avenue Blanc
CH-1202 GENEVA
Tel: (022) 32-48-00
CH,CM,CS

Hewlett-Packard (Schweiz) AG
19 Chemin Château Bloc
CH-1219 LE LIGNON-Geneva
Tel: (022) 96-03-22
Telex: 27333 hpag ch
Cable: HEWPACKAG Geneva
A,E,MS,P
Hewlett-Packard (Schweiz) AG
Allmend 2
CH-8967 WIDEN
Tel: (57) 31 21 11
Telex: 53933 hpag ch
Cable: HPAG CH
A,CH,CM,CS,E,MS,P

SYRIA
General Electronic Inc.
Nuri Basha
P.O. Box 5781
OAMASCUS
Tel: 33-24-87
Telex: 11216 ITIKAL SY
Cable: ELECTROBOR OAMASCUS
E

Middle East Electronics
Place Azmé
Boite Postale 2308
DAMASCUS
Tel: 334592
Telex: 11304 SATACO SY
M,P

TAIWAN
Hewlett-Packard Far East Ltd.
Kaohsiung Office
2/F 68-2, Chung Cheng 3rd Road
KAOHSIUNG
Tel: 241-2318, 261-3253
CH,CS,E
Hewlett-Packard Far East Ltd.
Taiwan Branch
5th Floor
205 Tun Hwa North Road
TAIPEI
Tel: (02) 751-0404
Cable: HEWPACK Taipei
A,CH,CM,CS,E,M,P
Ing Lih Trading Co.
3rd Floor, 7 Jen-Ai Road, Sec. 2
TAIPEI 100
Tel: (02) 3948191
Cable: INGLIH TAIPEI
A

THAILAND
Unimesa
30 Patpong Ave., Suriwong
BANGKOK 5
Tel: 234 091, 234 092
Telex: B4439 Simonco TH
Cable: UNIMESA Bangkok
A,CH,CS,E,M
Bangkok Business Equipment Ltd.
5/5-6 Dejo Road
BANGKOK
Tel: 234-8670, 234-8671
Telex: 87669-BEQUIPT TH
Cable: BUSIQUIPT Bangkok
P

TRINIDAD & TOBAGO
Caribbean Telecoms Ltd.
50/A Jerningham Avenue
P.O. Box 732
PORT-OF-SPAIN
Tel: 62-44213, 62-44214
Telex: 235,272 HUGCO WG
A,CM,E,M,P

TUNISIA
Tunisie Electronique
31 Avenue de la Liberté
TUNIS
Tel: 280-144
E,P
Corema
1 ter. Av. de Carthage
TUNIS
Tel: 253-821
Telex: 12319 CABAM TN
M

TURKEY
Teknim Company Ltd.
Iran Caddesi No. 7
Kavaklıdere, **ANKARA**
Tel: 275800
Telex: 42155 TKNM TR
E
E.M.A.
Medina Eldem Sokak No.41/6
Yüksel Caddesi
ANKARA
Tel: 175 622
M

UNITED ARAB EMIRATES
Emilac Ltd.
P.O. Box 1641
SHARJAH
Tel: 354121, 354123
Telex: 68136 Emilac Sh
CH,CS,E,M,P



UNITED KINGDOM

see: GREAT BRITAIN

NORTHERN IRELAND

SCOTLAND

UNITED STATES

Alabama

Hewlett-Packard Co.
700 Century Park South
Suite 128
BIRMINGHAM, AL 35226
Tel: (205) 822-6802
CH,MP
Hewlett-Packard Co.
P.O. Box 4207
8290 Whitesburg Drive, S.E.
HUNTSVILLE, AL 35802
Tel: (205) 881-4591
CH,CM,CS,E,M*

Alaska

Hewlett-Packard Co.
1577 "C" Street, Suite 252
ANCHORAGE, AK 99501
Tel: (907) 276-5709
CH*

Arizona

Hewlett-Packard Co.
2336 East Magnolia Street
PHOENIX, AZ 85034
Tel: (602) 273-8000
A,CH,CM,CS,E,MS
Hewlett-Packard Co.
2424 East Aragon Road
TUCSON, AZ 85706
Tel: (602) 889-4631
CH,E,MS**
Hewlett-Packard Co.
P.O. Box 5646
Brady Station
LITTLE ROCK, AR 72215
111 N. Filmore
LITTLE ROCK, AR 72205
Tel: (501) 664-8773, 376-1844
MS
California
Hewlett-Packard Co.
99 South Hill Or.
BRISBANE, CA 94005
Tel: (415) 330-2500
CH,CS
Hewlett-Packard Co.
7621 Canoga Avenue
CANOGA PARK, CA 91304
Tel: (213) 702-8300
A,CH,CS,E,P
Hewlett-Packard Co.
5060 Clinton Avenue
FRESNO, CA 93727
Tel: (209) 252-9652
MS
Hewlett-Packard Co.
P.O. Box 4230
1430 East Orangethorpe
FULLERTON, CA 92631
Tel: (714) 870-1000
CH,CM,CS,E,MP
Hewlett-Packard Co.
320 S. Kellogg, Suite 8
GOLETA, CA 93117
Tel: (805) 967-3405
CH
Hewlett-Packard Co.
5400 W. Rosecrans Boulevard
LAWDALE, CA 90260
P.O. Box 92105
LOS ANGELES, CA 90009
Tel: (213) 970-7500
Telex: 910-325-6608
CH,CM,CS,MP
Hewlett-Packard Co.
3200 Hillview Avenue
PALO ALTO, CA 94304
Tel: (415) 857-8000
CH,CS,E

Hewlett-Packard Co.
P.O. Box 15978 (95813)
4244 So. Market Court, Suite A
SACRAMENTO, CA 95834
Tel: (916) 929-7222
A*,CH,CS,E,MS

Hewlett-Packard Co.
9606 Aero Drive
P.O. Box 23333
SAN DIEGO, CA 92123
Tel: (714) 279-3200
CH,CM,CS,E,MP

Hewlett-Packard Co.
2305 Camino Ramon "C"
SAN RAMON, CA 94583
Tel: (415) 838-5900
CH,CS

Hewlett-Packard Co.
P.O. Box 4230
Fullerton, CA 92631
363 Brookhollow Drive
SANTA ANA, CA 92705
Tel: (714) 641-0977
A,CH,CM,CS,MP
Hewlett-Packard Co.
Suite A
5553 Hollister
SANTA BARBARA, CA 93111
Tel: (805) 964-3390
Hewlett-Packard Co.
3003 Scott Boulevard
SANTA CLARA, CA 95050
Tel: (408) 988-7000
A,CH,CM,CS,E,MP
Hewlett-Packard Co.
5703 Corsa Avenue
WESTLAKE VILLAGE, CA 91362
Tel: (213) 706-6800
E*,CH*,CS*

Colorado

Hewlett-Packard Co.
24 Inverness Place, East
ENGLEWOOD, CO 80112
Tel: (303) 771-3455
Telex: 910-935-0785
A,CH,CM,CS,E,MS

Connecticut

Hewlett-Packard Co.
47 Barnes Industrial Road South
P.O. Box 5007
WALLINGFORD, CT 06492
Tel: (203) 265-7801
A,CH,CM,CS,E,MS

Florida

Hewlett-Packard Co.
P.O. Box 24210 (33307)
2901 N.W. 62nd Street
FORT LAUDERDALE, FL 33307
Tel: (305) 973-2600
CH,CS,E,MP
Hewlett-Packard Co.
4080 Woodcock Drive, #132
Brownell Building
JACKSONVILLE, FL 32207
Tel: (904) 398-0663
C*,E*,MS**
Hewlett-Packard Co.
1101 W. Hibiscus Ave., Suite E210
MELBOURNE, FL 32901
Tel: (305) 729-0704
E*
Hewlett-Packard Co.
P.O. Box 13910 (32859)
6177 Lake Ellenor Drive
ORLANDO, FL 32809
Tel: (305) 859-2900
A,CH,CM,CS,E,MS

Hewlett-Packard Co.
6425 N. Pensacola Blvd.
Suite 4, Building 1
P.O. Box 12826
PENSACOLA, FL 32575
Tel: (904) 476-8422
A,MS
Hewlett-Packard Co.
57508 N. Hoover Blvd., Suite 123
TAMPA, FL 33614
Tel: (813) 884-3282
A*,CH,CM,CS,E*,M*

Georgia

Hewlett-Packard Co.
P.O. Box 105005
ATLANTA, GA 30348
2000 South Park Place
ATLANTA, GA 30339
Tel: (404) 955-1500
Telex: 810-766-4890
A,CH,CM,CS,E,MP
Hewlett-Packard Co.
P.O. Box 816 (80903)
2531 Center West Parkway
Suite 110
AUGUSTA, GA 30904
Tel: (404) 736-0592
MS
Hewlett-Packard Co.
200-E Montgomery Cross Rds.
SAVANNAH, GA 31401
Tel: (912) 925-5358
CH**
Hewlett-Packard Co.
P.O. Box 2103
WARNER ROBINS, GA 31099
1172 N. Davis Drive
WARNER ROBINS, GA 31093
Tel: (912) 923-8831
E

Hewlett-Packard Co.
200-E Montgomery Cross Rds.
SAVANNAH, GA 31401
Tel: (912) 925-5358
CH**

Hewlett-Packard Co.
P.O. Box 2103
WARNER ROBINS, GA 31099
1172 N. Davis Drive
WARNER ROBINS, GA 31093
Tel: (912) 923-8831
E

Hawaii

Hewlett-Packard Co.
Kawaiahao Plaza, Suite 190
567 South King Street
HONOLULU, HI 96813
Tel: (808) 526-1555
A,CH,E,MS

Illinois

Hewlett-Packard Co.
211 Prospect Road, Suite C
BLOOMINGTON, IL 61701
Tel: (309) 662-9411
CH,MS**

Hewlett-Packard Co.
1100 31st Street, Suite 100
DOWNS GROVE, IL 60515
Tel: (312) 960-5760
CH,CS

Hewlett-Packard Co.
5201 Tollview Drive
ROLLING MEADOWS, IL 60008
Tel: (312) 255-9800
A,CH,CM,CS,E,MP

Indiana

Hewlett-Packard Co.
P.O. Box 50807
7301 No. Shadeland Avenue
INDIANAPOLIS, IN 46250
Tel: (317) 842-1000
A,CH,CM,CS,E,MS

Iowa

Hewlett-Packard Co.
1776 22nd Street, Suite 1
WEST DES MOINES, IA 50265
Tel: (515) 224-1435
CH,MS**
Hewlett-Packard Co.
2415 Heinz Road
IOWA CITY, IA 52240
Tel: (319) 351-1020
CH,E*,MS

Kansas

Hewlett-Packard Co.
1644 S. Rock Road
WICHITA, KA 67207
Tel: (316) 684-8491
CH
Kentucky
Hewlett-Packard Co.
10300 Linn Station Road
Suite 100
LOUISVILLE, KY 40223
Tel: (502) 426-0100
A,CH,CS,MS

Louisiana

Hewlett-Packard Co.
8126 Calais Bldg.
BATON ROUGE, LA 70806
Tel: (504) 467-4100
A*,CH**
Hewlett-Packard Co.
P.O. Box 1449
KENNER, LA 70062
160 James Drive East
DESTAHAN, LA 70047
Tel: (504) 467-4100
A,CH,CS,E,MS

Maryland

Hewlett-Packard Co.
7121 Standard Drive
HANOVER, MD 21076
Tel: (301) 796-7700
Telex: 710-862-1943
Eff. Dec. 1, 1982
3701 Koppers St.
BALTIMORE, MD 21227
Tel: (301) 644-5800
A,CH,CM,CS,E,MS
Hewlett-Packard Co.
2 Choke Cherry Road
ROCKVILLE, MD 20850
Tel: (301) 918-6370
A,CH,CM,CS,E,MP

Massachusetts

Hewlett-Packard Co.
32 Hartwell Avenue
LEXINGTON, MA 02173
Tel: (617) 861-8960
A,CH,CM,CS,E,MP

Michigan

Hewlett-Packard Co.
23855 Research Drive
FARMINGTON HILLS, MI 48024
Tel: (313) 476-6400
A,CH,CM,CS,E,MP
Hewlett-Packard Co.
4326 Cascade Road S.E.
GRAND RAPIDS, MI 49506
Tel: (616) 957-1970
CH,CS,MS

Hewlett-Packard Co.
1771 W. Big Beaver Road
TROY, MI 48064
Tel: (313) 643-6474
CH,CS

Minnesota

Hewlett-Packard Co.
2025 W. Larpentur Ave.
ST. PAUL, MN 55113
Tel: (612) 644-1100
A,CH,CM,CS,E,MP

Mississippi

Hewlett-Packard Co.
P.O. Box 5028
1675 Lakeland Drive
JACKSON, MS 39216
Tel: (601) 982-9363
MS

Missouri

Hewlett-Packard Co.
11131 Colorado Avenue
KANSAS CITY, MO 64137
Tel: (816) 763-8000
A,CH,CM,CS,E,MS

Hewlett-Packard Co.
P.O. Box 27307
1024 Executive Parkway
ST. LOUIS, MO 63141
Tel: (314) 878-0200
A,CH,CS,E,MP
Effective September 1982:
13001 Hollenberg Drive
BRIDGETON, MO 63044

Nebraska

Hewlett-Packard
7101 Mercy Road
Suite 101, 18X Building
OMAHA, NE 68106
Tel: (402) 392-0948
CM,MS

Navada

Hewlett-Packard Co.
Suite 0-130
5030 Paradise Blvd.
LAS VEGAS, NV 89119
Tel: (702) 738-6610
MS**

New Jersey

Hewlett-Packard Co.
W120 Century Road
PARAMUS, NJ 07652
Tel: (201) 265-5000
A,CH,CM,CS,E,MP
Hewlett-Packard Co.
60 New England Av. West
PISCATAWAY, NJ 08854
Tel: (201) 981-1199
A,CH,CM,CS,E

New Mexico

Hewlett-Packard Co.
P.O. Box 11634
ALBUQUERQUE, NM 87112
11300 Lomas Blvd., N.E.
ALBUQUERQUE, NM 87123
Tel: (505) 292-1330
Telex: 910-989-1185
CH,CS,E,MS

New York

Hewlett-Packard Co.
5 Computer Drive South
ALBANY, NY 12205
Tel: (518) 458-1550
Telex: 710-444-4691
A,CH,E,MS
Hewlett-Packard Co.
P.O. Box 297
9600 Main Street
CLARENCE, NY 14031
Tel: (716) 759-8621
Telex: 710-523-1893
CH

Hewlett-Packard Co.
200 Cross Keys Office
FAIRPORT, NY 14450
Tel: (716) 223-9950
Telex: 510-253-0092
CH,CM,CS,E,MS

Hewlett-Packard Co.
7641 Henry Clay Blvd.
LIVERPOOL, NY 13088
Tel: (315) 451-1820
A,CH,CM,E,MS

Hewlett-Packard Co.
No. 1 Pennsylvania Plaza
55th Floor
34th Street & 8th Avenue
NEW YORK, NY 10119
Tel: (212) 971-0800
CH,CS,E*,M*



SALES & SUPPORT OFFICES

Arranged Alphabetically by Country

Hewlett-Packard Co.
250 Westchester Avenue
WHITE PLAINS, NY 10604
CM,CH,CS,E
Hewlett-Packard Co.
3 Crossways Park West
WOODBURY, NY 11797
Tel: (516) 921-0300
Telex: 510-221-2183
A,CH,CM,CS,E,MS

North Carolina

Hewlett-Packard Co.
4915 Water's Edge Drive
Suite 160
RALEIGH, NC 27606
Tel: (919) 851-3021
C,M

Hewlett-Packard Co.
P.O. Box 26500
5605 Roanne Way
GREENSBORO, NC 27450
Tel: (919) 852-1800
A,CH,CM,CS,E,MS

Ohio

Hewlett-Packard Co.
9920 Carver Road
CINCINNATI, OH 45242
Tel: (513) 891-9870
CH,CS,MS

Hewlett-Packard Co.
16500 Sprague Road
CLEVELAND, OH 44130
Tel: (216) 243-7300
Telex: 810-423-9430
A,CH,CM,CS,E,MS

Hewlett-Packard Co.
962 Crupper Ave.
COLUMBUS, OH 43229
Tel: (614) 436-1041
CH,CM,CS,E*

Hewlett-Packard Co.
P.O. Box 280
330 Progress Rd.
DAYTON, OH 45449
Tel: (513) 859-8202
A,CH,CM,E*,MS

Oklahoma

Hewlett-Packard Co.
P.O. Box 32008
Oklahoma City, OK 73123
1503 W. Gore Blvd., Suite #2
LAWTON, OK 73505
Tel: (405) 248-4248
C

Hewlett-Packard Co.
P.O. Box 32008
OKLAHOMA CITY, OK 73123
304 N. Meridian Avenue, Suite A
OKLAHOMA CITY, OK 73107
Tel: (405) 946-9499
A*,CH,E*,MS

Hewlett-Packard Co.
Suite 121
9920 E. 42nd Street
TULSA, OK 74145
Tel: (918) 665-3300
A** ,CH,CS,M*

Oregon

Hewlett-Packard Co.
1500 Valley River Drive
Suite 330
EUGENE, OR 97401
Tel: (503) 683-8075
C

Hewlett-Packard Co.
9255 S. W. Pioneer Court
WILSONVILLE, OR 97070
Tel: (503) 682-8000
A,CH,CS,E*,MS

Pennsylvania

Hewlett-Packard Co.
1021 8th Avenue
King of Prussia Industrial Park
KING OF PRUSSIA, PA 19406
Tel: (215) 265-7000
Telex: 510-660-2670
A,CH,CM,CS,E,MP

Hewlett-Packard Co.
111 Zeta Drive
PITTSBURGH, PA 15238
Tel: (412) 782-0400
A,CH,CS,E,MP

South Carolina

Hewlett-Packard Co.
P.O. Box 21708
Brookside Park, Suite 122
1 Harbison Way
COLUMBIA, SC 29210
Tel: (803) 732-0400
CH,E,MS

Hewlett-Packard Co.
Koger Executive Center
Chesterfield Bldg., Suite 124
GREENVILLE, SC 29615
Tel: (803) 748-5601
C

Tennessee

Hewlett-Packard Co.
P.O. Box 22490
224 Peters Road
Suite 102
KNOXVILLE, TN 37922
Tel: (615) 691-2371
A*,CH,MS

Hewlett-Packard Co.
3070 Directors Row
MEMPHIS, TN 38131
Tel: (901) 346-8370
A,CH,MS

Hewlett-Packard Co.
230 Great Circle Road
Suite 216
NASHVILLE, TN 32228
Tel: (615) 255-1271
MS**

Texas

Hewlett-Packard Co.
Suite 310W
7800 Shoalcreek Blvd.
AUSTIN, TX 78757
Tel: (512) 459-3143
E

Hewlett-Packard Co.
Suite C-110
4171 North Mesa
EL PASO, TX 79902
Tel: (915) 533-3555, 533-4489
CH,E*,MS**

Hewlett-Packard Co.
5020 Mark IV Parkway
FORT WORTH, TX 76106
Tel: (817) 625-6361
CH,CS*

Hewlett-Packard Co.
P.O. Box 42816
HOUSTON, TX 77042
10535 Harwin Street
HOUSTON, TX 77036
Tel: (713) 776-6400
A,CH,CM,CS,E,MP

Hewlett-Packard Co.
3309 67th Street
Suite 24
LUBBOCK, TX 79413
Tel: (806) 799-4472
M

Hewlett-Packard Co.
417 Nolana Gardens, Suite C
P.O. Box 2256
McALLEN, TX 78501
Tel: (512) 781-3226
CH,CS

Hewlett-Packard Co.
P.O. Box 1270
RICHARDSON, TX 75080
930 E. Campbell Rd.
RICHARDSON, TX 75081
Tel: (214) 231-6101
A,CH,CM,CS,E,MP

Hewlett-Packard Co.
P.O. Box 32993
SAN ANTONIO, TX 78216
1020 Central Parkway South
SAN ANTONIO, TX 78232
Tel: (512) 494-9336
CH,CS,E,MS

Utah

Hewlett-Packard Co.
P.O. Box 26626
3530 W. 2100 South
SALT LAKE CITY, UT 84119
Tel: (801) 974-1700
A,CH,CS,E,MS

Virginia

Hewlett-Packard Co.
P.O. Box 9669
2914 Hungary Spring Road
RICHMOND, VA 23228
Tel: (804) 285-3431
A,CH,CS,E,MS

Hewlett-Packard Co.
3106 Peters Creek Road, N.W.
ROANOKE, VA 24019
Tel: (703) 563-2205
CH,E**

Hewlett-Packard Co.
5700 Thurston Avenue
Suite 111
VIRGINIA BEACH, VA 23455
Tel: (804) 460-2471
CH,MS

Washington

Hewlett-Packard Co.
15815 S.E. 37th Street
BELLEVUE, WA 98006
Tel: (206) 643-4000
A,CH,CM,CS,E,MP

Hewlett-Packard Co.
Suite A
708 North Argonne Road
SPOKANE, WA 99206
Tel: (509) 922-7000
CH,CS

West Virginia

Hewlett-Packard Co.
4604 MacCorkle Ave., S.E.
CHARLESTON, WV 25304-4297
Tel: (304) 925-0492
A,MS

Wisconsin

Hewlett-Packard Co.
150 S. Sunny Slope Road
BROOKFIELD, WI 53005
Tel: (414) 784-8800
A,CH,CS,E*,MP

URUGUAY

Pablo Ferrando S.A.C. e L.
Avenida Italia 2877
Casilla de Correo 370
MONTEVIDEO
Tel: 80-2586
Telex: Public Booth 901
A,CM,E,M

Guillermo Kraft del Uruguay S.A.
Av. Lib. Brig. Gral. Lavalleja 2083
MONTEVIDEO
Tel: 234588, 234808, 208830
Telex: 22030 ACTOUR UY
P

VENEZUELA

Hewlett-Packard de Venezuela C.A.
3A Transversal Los Ruices Norte
Edificio Segre
Apartado 50933
CARACAS 1071
Tel: 239-4133
Telex: 25146 HEWPACK
A,CH,CS,E,MS,P
Colimodio S.A.
Este 2 - Sur 21 No. 148
Apartado 1053
CARACAS 1010
Tel: 571-3511
Telex: 21529 COLMODIO
M

Headquarters offices

If there is no sales office listed for your area,
contact one of these headquarters offices.

NORTH/CENTRAL

AFRICA

Hewlett-Packard S.A.
7 Rue du Bois-du-Lan
CH-1217 MEYRIN 2, Switzerland
Tel: (022) 98-96-51
Telex: 27835 hpse
Cable: HEWPACKSA Geneve

ASIA

Hewlett-Packard Asia Ltd.
6th Floor, Sun Hung Kai Center
30 Harbor Rd.
G.P.O. Box 795
HONG KONG
Tel: 5-832 3211
Telex: 66678 HEWPA HX
Cable: HEWPACK HONG KONG

CANADA

Hewlett-Packard (Canada) Ltd.
6877 Goreway Drive
MISSISSAUGA, Ontario L4V 1M8
Tel: (416) 678-9430
Telex: 610-492-4246

EASTERN EUROPE

Hewlett-Packard Ges.m.b.h.
Liebigasse 1
P.O. Box 72
A-1222 VIENNA, Austria
Tel: (222) 2365110
Telex: 1 3 4425 HEPA A

NORTHERN EUROPE

Hewlett-Packard S.A.
Uilenstede 475
NL-1183 AG AMSTELVEEN
The Netherlands
P.O. Box 999
NL-1180 AZ AMSTELVEEN
The Netherlands
Tel: 20 437771

OTHER EUROPE

Hewlett-Packard S.A.
7 Rue du Bois-du-Lan
CH-1217 MEYRIN 2, Switzerland
Tel: (022) 98-96-51
Telex: 27835 hpse
Cable: HEWPACKSA Geneve
(Offices in the World Trade Center)

ZIMBABWE

Field Technical Sales
45 Kelvin Road, North
P.B. 3458
SALISBURY
Tel: 705 231
Telex: 4-122 RH
C,E,M,P

MEDITERRANEAN AND

MIDDLE EAST

Hewlett-Packard S.A.
Mediterranean and Middle East
Operations
Atrina Centre
32 Kifissias Ave.
Maroussi, ATHENS, Greece
Tel: 682 88 11
Telex: 21-6588 HPAT GR
Cable: HEWPACKSA Athens

EASTERN USA

Hewlett-Packard Co.
4 Choke Cherry Road
Rockville, MD 20850
Tel: (301) 258-2000

MIDWESTERN USA

Hewlett-Packard Co.
5201 Tollview Drive
ROLLING MEADOWS, IL 60008
Tel: (312) 255-9800

SOUTHERN USA

Hewlett-Packard Co.
P.O. Box 105005
450 Interstate N. Parkway
ATLANTA, GA 30339
Tel: (404) 955-1500

WESTERN USA

Hewlett-Packard Co.
3939 Lankersim Blvd.
LOS ANGELES, CA 91604
Tel: (213) 877-1282

OTHER INTERNATIONAL AREAS

Hewlett-Packard Co.
Intercontinental Headquarters
3495 Oer Creek Road
PALO ALTO, CA 94304
Tel: (415) 857-1501
Telex: 034-8300
Cable: HEWPACK



HEWLETT
PACKARD